Appendix G.2, Noise Modeling Technical Report

Houston OAPM

Environmental Assessment

Noise Modeling and Analysis

HMMH Report No. 305220.001N
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1 Background

This report presents the evaluation of the aircraft noise environment to support the Federal Aviation Administration's (FAA) Houston Optimization of Airspace and Procedures in the Metroplex (OAPM) Environmental Assessment (EA).

A "metroplex" is a major metropolitan area with multiple airports, where heavy air traffic and environmental constraints combine to hinder efficient aircraft movement. The Houston OAPM project would improve the efficiency of the national airspace system in the Houston metroplex by optimizing aircraft arrival and departure procedures at a number of airports, including George Bush Intercontinental Airport (IAH) and William P. Hobby Airport (HOU). The project would involve changes in aircraft flight paths and altitudes in certain areas. Specifically, the FAA proposes to publish and implement optimized standard arrival and departure instrument procedures, serving air traffic flows into and out of airports in the Houston Metroplex. The proposed action would not require any ground disturbance or increase the number of aircraft operations within southeast Texas airspace. The analysis of potential environmental impacts is conducted in accordance with FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures" (FAA Order 1050.1E). [1]

The aircraft noise evaluation or analysis requires using a Federal Aviation Administration (FAA)-approved aircraft noise modeling tool with data inputs based on the airport runway configuration, aircraft operations, runway utilization, flight tracks, aircraft performance characteristics, and meteorological data. This report presents guidance established by the FAA for noise analyses, noise model input development, and documents the aircraft noise conditions for the existing year (2012), the expected year of implementation (2014), and five years after the year of implementation (2019). The Proposed Action considered in this analysis was defined by the Houston OAPM Design and Implementation (D&I) Team.[2]

FAA Order 1050.1E provides specific guidance and requirements for assessing the potential aircraft noise impacts on the community with respect to changes to aircraft procedures, airspace, etc. The Order requires that the analysis use the Day-Night Average Sound Level (DNL) metric to determine these aircraft noise impacts based on defined threshold levels above which changes in aircraft noise levels may cause a significant impact. The Order defines a significant impact as an increase in aircraft noise of DNL 1.5 dB for noise-sensitive areas exposed to aircraft noise of DNL 65 dB and higher. The comparison is done for two forecast years. [3]

In 1990, the FAA issued a noise screening procedure to evaluate whether certain airspace actions above 3,000 feet above ground level (AGL) might increase DNL levels by 5 dB or more. The procedure served as a response to the FAA's experience that increases in DNL of 5 dB or more at cumulative levels well below DNL 65 dB could be disturbing to people and become a source of public concern. In 1992, the Federal Interagency Committee on Noise (FICON)[4] recommended that in instances where there are DNL increases of 1.5 dB or more at noise sensitive locations at or above DNL 65 dB, that DNL increases of 3 dB or more between DNL 60 dB and 65 dB should also be evaluated. DNL increases of 3 dB below DNL

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[1] FAA Order 1050.1E, Chg 1, March 20, 2006
[2] Materials provided include Proposed Final Design Packages dated between June 28, 2012 and January 10, 2013 which are included in a separate appendix to the EA "Houston OAPM Design and Implementation Team Documents"; TARGETS files "Final Houston OAPM DI Team Master.100912.V4.8.tgs" and "Final Houston OAPM DI Team Master.package.111512.V4.8.tgs". TARGETS (Terminal Area Route Generation, Evaluation, and Traffic Simulation) is a software tool developed by The MITRE Corporation.
[3] FAA Order 1050.1E, Chg. 1, Appendix. A, sec.14.3.
[4] http://www.fican.org/pdf/nai-8-92.pdf

65 dB are not "significant impacts" but are to receive consideration in the environmental documentation. The FAA has adopted FICON's recommendation in FAA Order 1050.1E.[5] The Order also provides that change in DNL of 5 dB or greater between DNL 45 dB and 60 dB should be considered for airspace actions.[6] Table 1 summarizes the criteria used to assess the impact of change in noise exposure attributable to the Proposed Action compared with the No Action Alternative. For clarity, this document uses the term "reportable increase" in referring to DNL increases of 3 dB or more between DNL 60 dB and 65 dB and DNL increases of 5 dB or more between DNL 45 dB and 60 dB.

Table 1 Criteria for Determining Impact of Changes in Aircraft Noise (Proposed Action compared with No Action)

DNL Noise Exposure under Proposed Action	Increase in DNL with Proposed Action	Aircraft Noise Exposure Change Consideration
DNL 65 dB and higher	DNL 1.5 dB or greater[1]	Significant Impact
DNL 60 dB to 65 dB	DNL 3.0 dB or greater[2]	Reportable Increase
DNL 45 dB to 60 dB	DNL 5.0 dB or greater[2]	Reportable Increase

Notes/Sources:
1 Source FAA, Order 1050.1E, Appendix A, Paragraph 14.3;
2 Source FAA Order 1050.1E, Appendix A, Paragraph 14.5e.
Prepared by: Harris Miller Miller & Hanson Inc., January 2013

Detailed noise analysis was conducted for the two primary airports (IAH and HOU) and five of the fifteen satellite airports in the Houston OAPM EA study area. The process to determine which satellite airports to include in the analysis is described in Section 4.1.

In accordance with FAA Order 1050.1E, this analysis considers the noise exposure for the following five (5) scenarios:

- *2012 Existing Conditions* – routes flown in the 2012 calendar year
- *2014 No Action* – routes which would be flown in the year 2014 if no Proposed Action airspace changes are implemented
- *2014 Proposed Action* – routes which would be flown in the year 2014 if the Proposed Action airspace changes are implemented
- *2019 No Action* – routes which would be flown in the year 2019 if no Proposed Action airspace changes are implemented
- *2019 Proposed Action* – routes which would be flown in the year 2019 if the Proposed Action airspace changes are implemented

The 2014 Proposed Action DNL noise levels are compared to the 2014 No Action Alternative DNL noise levels to determine if there would be any increases in noise levels that would meet or exceed the FAA's criteria in Table 1. Likewise, the 2019 Proposed Action DNL noise levels are compared to the 2019 No Action Alternative DNL noise levels and are compared to the FAA's criteria in Table 1.

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5 FAA Order 1050.1E, Chg. 1, Appendix. A, sec.14.4c.
6 FAA Order 1050.1E, Chg. 1, Appendix. A, sec.14.5e.

2 Development of the Study Area

One of the first steps in the environmental analysis is to determine the study area or geographic area that may potentially be affected by the Proposed Action. Aircraft noise was assumed to be the primary consideration in determining the extent of this area. In accordance with FAA Order 1050.1E, noise modeling was conducted using the Noise Integrated Routing System (NIRS)[7] to determine noise impacts from the ground to 10,000 feet AGL.[8] In addition, FAA Order JO 7400.2J "Procedures for Handling Airspace Matters" states, "Consideration for analyzing the proposed change between 10,000 ft. and 18,000 ft. AGL will be given when there is a National Park or Wildlife Refuge in the study area and the change is likely to be highly controversial."[9] Based on prior environmental experience with similar actions, two study areas were established for the EA: a Primary Study Area (PSA) to analyze noise impacts of aircraft operations from the surface to 10,000 feet AGL and a Supplemental Study Area (SSA) for aircraft operations from 10,000 feet AGL to 18,000 Feet AGL.

2.1 Data Acquisition

Existing flight paths in the southeast Texas region were evaluated as a basis to determine where Proposed Action changes are likely to occur. The FAA collected radar data for arrival and departure operations from airports in the southeast Texas region during 2010-2011, focusing on aircraft traffic controlled by the ZHU ARTCC and the I90 TRACON. The ZHU ARTCC is located at IAH and controls airspace in southern Texas, Louisiana, southern Mississippi, southwestern Alabama, and areas in the Gulf of Mexico. The I90 TRACON provides approach control for airports within the Houston Metroplex. This analysis gathered representative radar data, specific to the region, from the FAA's National Offload Program (NOP) for thirty-six (36) 24-hour periods between October 3, 2010 and September 26, 2011, providing an accurate representation of overall annual conditions. Table 2 presents the dates included in the data sample.

Table 2 Listing of Days Included in Radar Flight Data Sample for 2010 and 2011

2010	2011			
October 4	January 8	April 12	June 3	August 3
October 13	January 13	May 6	June 17	August 19
November 5	January 16	May 19	July 2	September 2
November 15	February 7	May 21	July 17	September 9
December 17	February 26	May 22	July 25	September 12
December 25	March 9	May 26	July 29	September 23
December 28	March 17	May 30	July 31	September 26
December 30				
Source: National Offload Program, Mitre Corp.				

[7] The Noise Integrated Routing System (NIRS) is a noise-assessment program designed to provide an analysis of air traffic changes over broad areas. Reference Section 3 for more details related to NIRS.
[8] FAA Order 1050.1E, Appendix A, section 14.5e.
[9] See FAA Order JO 7400.2J, section 32-2-1.b.

2.2 Methodology to Determine the Study Area

The maximum terrain elevation in southeastern Texas is at or below 500 feet above Mean Sea Level (MSL) and therefore the ceiling for the PSA was established at 10,500 feet MSL as an approximation of 10,000 ft. AGL.[10] A review of radar data showed that approximately 95 percent of Instrument Flight Rule (IFR)[11] Houston Metroplex jet aircraft operations below 10,500 feet MSL occur within 50 nautical miles of a point midway between IAH and HOU. [12] This became the PSA.

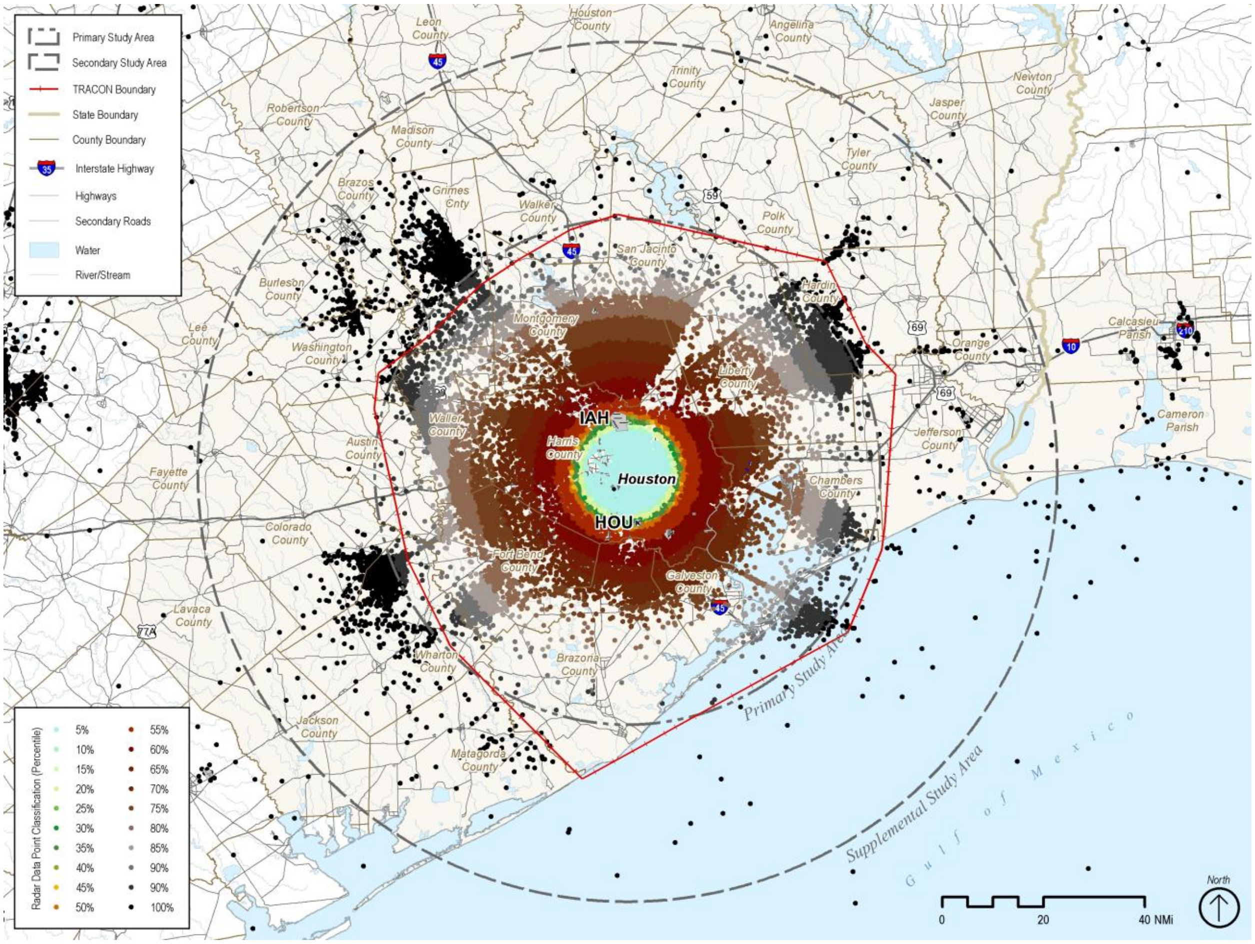
Figure 1 shows the development of the PSA. Each point represents a jet crossing altitude 10,500 ft. MSL. The aircraft altitude crossing points are color-coded to represent the relative distance from the study center in terms of cumulative percent. The PSA contains approximately 7,850 square nautical miles and includes 19 Texas counties in whole or in part.

Development of the SSA applied the same methodology as was used for the PSA. The ceiling for the SSA was established at 18,500 ft. MSL as an approximation of 18,000 ft. AGL.[13] Approximately 95 percent of IFR Houston Metroplex jet aircraft operations below 18,000 ft. AGL occur within 85 nautical miles of a point midway between IAH and HOU (the same center point of the PSA).

Figure 2 shows the development of the SSA. Each point represents a jet crossing altitude 18,500 ft. MSL. The aircraft altitude crossing points are color-coded to represent the relative distance from the study center in terms of cumulative percent. The SSA contains an additional 14,850 square nautical miles and includes an additional 16 Texas counties and two Louisiana parishes in whole or in part to those identified within the PSA.

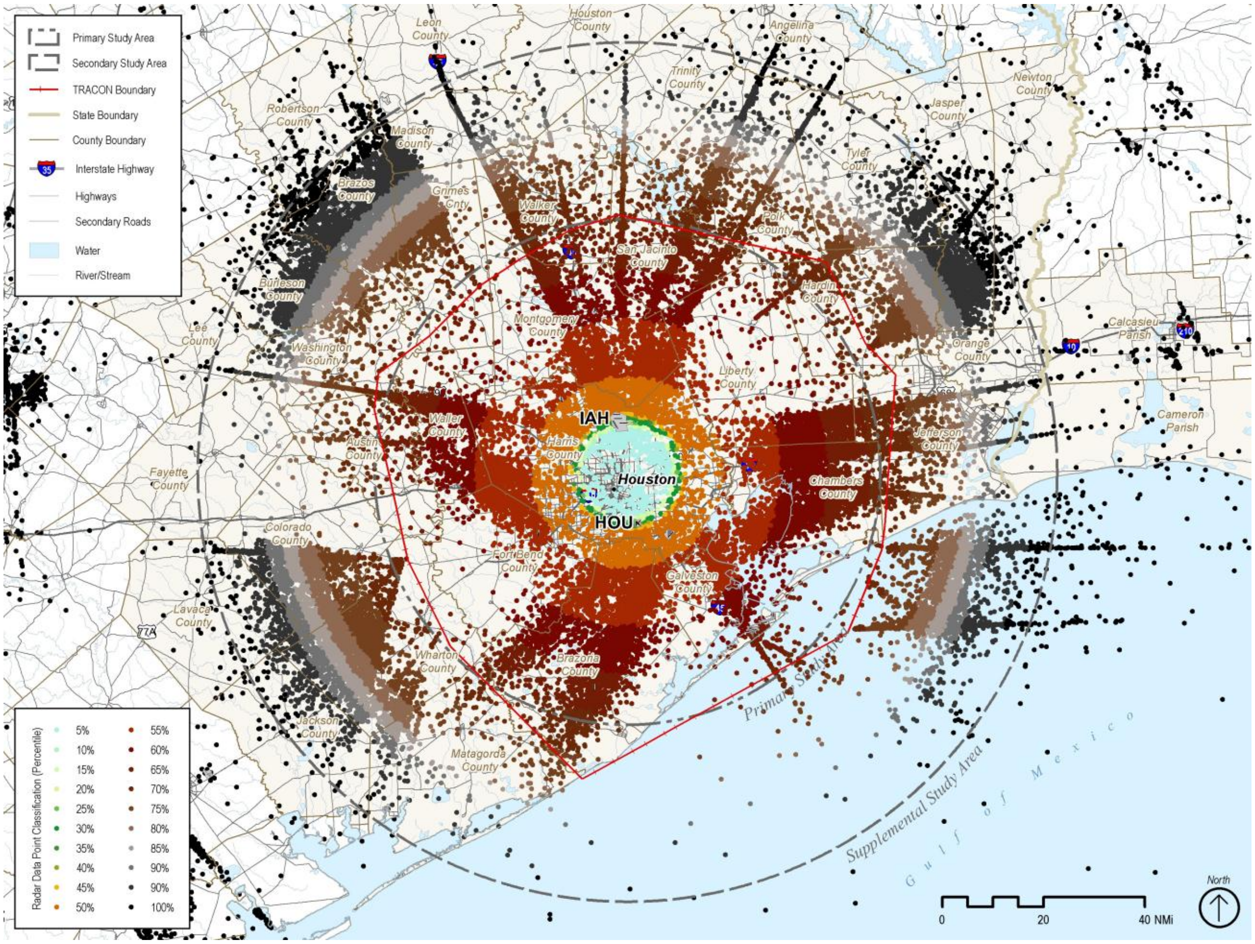
[10] Aircraft altitudes in the radar data set are reporting reference to Mean Sea Level.
[11] Instrument Flight Rules (IFR): Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan. (FAA,Pilot-Controller Glossary, July 26, 2012)
[12] The following coordinates were used to represent the mid-point between IAH and HOU: Latitude 29.815485 N, Longitude 95.310150 W.
[13] The aforementioned assumption that highest elevation in this region is 500 ft. MSL is still valid for the SSA.

Figure 1 Jet Operations and Development of the Primary Study Area



Note: Each point represents a jet crossing altitude 10,500 ft MSL that is color coded to represent the relative distance from the study center in terms of cumulative percent

Figure 2 Jet Operations and Development of the Supplemental Study Area



Note: Each point represents a jet crossing altitude 18,500 ft. MSL that is color coded to represent the relative distance from the study center in terms of cumulative percent

3 Noise Model Program

Prior to the development of an appropriate noise modeling program, limited technology was available to examine noise impacts associated with high-altitude air traffic changes. The FAA-accepted methodology to examine high altitude noise impacts was published in FAA Notice 7210.360, *Noise Screening for Certain Air Traffic Actions Above 3,000 Feet AGL*, on September 14, 1990. The process outlined in this notice was subsequently converted to the Air Traffic Noise Screening (ATNS) computer model v.1.0 in 1995. This model was further revised to its current form as v.2.0 in early 1999. However, the ATNS noise screening program was limited in its application because it could examine only one route at a time. The FAA recognized that there was a need to evaluate multiple proposed high-altitude air traffic changes simultaneously, and also to evaluate changes in noise levels due to flights at or below 3,000 feet when more efficient arrival and departure procedures are proposed. Consequently, the FAA expended considerable time, effort, and expense in combining airspace design criteria and noise modeling technology to examine the cumulative effect of multiple route changes and their effect on noise levels over a large geographical area containing multiple airports. The end product is a noise modeling program called the NIRS.

NIRS was initially developed in 1995 by the FAA Office of Environment and Energy (AEE-120), in cooperation with FAA Air Traffic (ATA-300), for assessing potential regional airspace design noise impacts. Its purpose is to assist the FAA in evaluating the environmental noise impacts of airspace routing and procedural alternatives designed to improve system safety and efficiency. It is specifically tailored to evaluate complex air traffic applications involving high-altitude routing (up to 18,000 feet Above Field Elevation [AFE]), broad area airspace changes affecting multiple airports, and other airspace modifications in the terminal and en route environments that cannot be assessed using other methods, most notably the ATNS and the FAA Integrated Noise Model (INM). NIRS evaluates noise impact by calculating DNL values for specific locations on the ground, based on population centroids and grid points.[14]

NIRS was validated by the FAA's Office of Environment and Energy against the INM tool in 1997. This process involved providing both models with identical inputs, and performing a detailed comparison of the resulting outputs for representative jet, turboprop, and propeller aircraft for both arrival and departure operations. The models were found to give the same results in terms of both final noise values and intermediate aircraft state parameters (position, altitude, thrust, and speed). An on-going program ensures compatibility of the two models. Based on these results and on technical oversight of the NIRS development process, the FAA Office of Environment and Energy approved the use of NIRS for airspace applications.

The NIRS noise assessment methodology, interpretation guidelines, and population-impact results have been briefed at several levels throughout the FAA and U.S. Environmental Protection Agency (USEPA). In addition, within the FAA, the Environmental Policy Team, Mission Support Services, and the Office of Environment and Energy assure that model integrity is maintained in terms of noise standards and equations, consistency with airport methodology, and reliability of use. NIRS has historically been the best available tool to model noise exposure changes for a study of this magnitude and meets FAA's environmental responsibilities in an accurate and cost-effective manner. NIRS Version 1.0 was released

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[14] 2010 Census Data, U.S. Census Bureau.

in June, 1998 as a prototype model. The version of NIRS which was used for the Houston OAPM EA is NIRS Version 7.0b.3, the current version at the time the analysis was begun.[15]

NIRS provides a powerful computational environment and graphical user interface, and provides the following major capabilities:

- Provides automated quantitative comparisons of noise impacts across alternative airspace designs.
- Imports and displays track and operation data from airspace models, and population data from other sources.
- Enables users to specify air traffic control altitudes, and automatically calculates required aircraft thrusts and speeds necessary for noise using the same up-to-date database used for the INM.[16]
- Calculates predicted noise impacts at all population centroids (or other specially defined points) in large study areas.
- Identifies and maps all areas of change in noise impact.
- Identifies traffic elements that are the principal causes of change in noise impact in each area of change.
- Provides data for quantification of mitigation goals and identification of mitigation opportunities.
- Applies multiple layers of data checking and quality control.

It should be noted that after the environmental analysis of the Houston OAPM project had begun, the FAA adopted the Aviation Environmental Design Tool (AEDT) , which replaces NIRS. However, consistent with current FAA policy and practice, the use of AEDT 2a is not required for projects whose environmental analysis had already started.[17]

[15] FAA released NIRS Version 7.0b.2 on March 2, 2012. This was the most current version of NIRS at the time of the noise analysis. NIRS Version 7.0b.3 was an update released August 8, 2012 and was used for this project. NIRS Version 7.0b.3 uses the same User's Guide as NIRS Version 7.0b.2.
[16] NIRS v.70b.3 uses the INM 7.0b version database.
[17] FAA Order 1050.1E, Change 1, Guidance Memo #4: Date - March 21, 2012; Subject-Guidance on Using AEDT 2a to Conduct Environmental Modeling for FAA Air Traffic and Procedure Actions; Source http://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/guidance/media/AEDT_Guidance_Memo.pdf

4 Noise Model Input Requirements

Noise modeling requires several types of input data: airport/runway locations, operational levels, day/night distributions, fleet mix, runway usage, noise-power-distance relationships, climb/descent profiles, aircraft weights, flight tracks, track dispersion information, and modeling locations (population and other model locations). Details of the input data to NIRS for the Houston OAPM EA project are discussed in the following sections.

4.1 Airport and Runway Data

There are two major airports, IAH and HOU, and fifteen satellite airports identified by the Houston OAPM D&I Team as possibly affected by the Proposed Action which are listed in Table 3. To determine whether the aircraft operations at each of these airports would warrant inclusion in the noise analysis, the FAA followed the guidance provided in Order 1050.1E[18] as detailed in HMMH Memorandum to FAA, "Recommended Satellite Airports for Noise Analysis – DRAFT", dated July 31, 2012.[19]

Only IFR operations are affected by the Proposed Action. IFR flight plan data were acquired for each of the candidate satellite airports for calendar year 2011.[20] The flight plan data for each airport were used to identify the IFR aircraft fleet mix, time of day operations and, through balancing the number of arrivals and departures to the same level, the IFR itinerant operations. The aircraft operations were then adjusted to Air Traffic Control Tower (ATCT) counts for those airports with towers or, for those airports without towers, adjusted using a scale factor having a similar relationship as the "towered" airports. Finally, the airport's aircraft operations were scaled to the FAA Terminal Area Forecast (TAF) for years 2014 and 2019 as shown in Table 4.

The FAA's Area Equivalent Method (AEM) was used, for each airport and forecast years 2014 and 2019, to estimate the area in square miles within the DNL 65 dB and DNL 60 dB contours for each airport and year. The results were compared to FAA guidance[21]. A second analysis checked to see if one or more operations per year could be affected by the Proposed Action.

As a result, the following five satellite airports recommended for further analysis are:

- David Wayne Hooks Memorial (DWH)
- Ellington Field (EFD)
- West Houston (IWS)
- Texas Gulf Coast Regional (LBX)
- Sugar Land Regional (SGR)

The FAA concurred with this recommendation.[22] All seven modeled airports (IAH, HOU, DWH, EFD, IWS, LBX, SGR) are collectively referred to as the Analyzed Airports.

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[18] FAA Order 1050.1E, Appendix A, Section 14.6 "Projects Not Requiring a Noise Analysis".
[19] This memorandum is included in Appendix A.
[20] Flight Plan Data and Radar Data from National Offload Program, (provided by Mitre Corp.)
[21] 1050.1E Appendix A, Section 14.6 criteria for the DNL 65dB contour is 0.5 square miles
[22] Email dated August 1, 2012. A copy is in Appendix A.

Table 3 Major Airports and Candidate Satellite Airports for Inclusion in Noise Analysis

Airport Name	FAA Airport Identifier
George Bush Intercontinental/Houston	IAH
William P. Hobby	HOU
Houston Southwest	AXH
Lone Star Executive	CXO
David Wayne Hooks Memorial	DWH
Ellington Field	EFD
Weiser Air Park	EYQ
Scholes International at Galveston	GLS
Baytown	HPY
West Houston	IWS
Texas Gulf Coast Regional	LBX
Pearland Regional	LVJ
Sugar Land Regional	SGR
Chambers County	T00
La Porte Municipal	T41
Houston Executive	TME
RWJ Airpark	54T
Source: Houston OAPM D&I Team	

Table 4 Calendar Year 2011 and Forecast Annual Aircraft Operations for Satellite Airports

Airport	Year	Aircraft Operations			
		IFR		VFR	Total
		Jets	Turboprops and Props		
AXH	2011	213	2,111	45,229	47,553
	2014	229	2,269	48,753	51,250
	2019	258	2,558	55,265	58,081
CXO	2011	2,923	7,306	49,390	59,619
	2014	3,012	7,529	46,815	57,356
	2019	3,018	7,542	48,424	58,984
DWH	2011	6,493	14,478	168,289	189,260
	2014	7,071	15,766	160,269	183,106
	2019	7,372	16,436	164,270	188,078
EFD	2011	13,507	8,064	123,131	144,702
	2014	13,507	8,064	123,131	144,702
	2019	13,507	8,064	123,131	144,702
EYQ	2011	22	1,025	36,953	38,000
	2014	24	1,105	39,835	40,964
	2019	27	1,251	45,120	46,398
GLS	2011	1,042	2,538	24,631	28,211
	2014	1,204	2,601	25,250	29,055
	2019	1,255	2,712	26,085	30,052
HPY	2011	395	1,307	7,898	9,600
	2014	426	1,409	8,514	10,349
	2019	482	1,597	9,642	11,722
IWS	2011	1,199	12,454	90,815	104,468
	2014	1,248	12,974	94,785	109,007
	2019	1,340	13,920	101,760	117,020
LBX	2011	2,417	2,640	74,641	79,698
	2014	2,567	2,806	79,718	85,091
	2019	2,856	3,120	88,972	94,948
LVJ	2011	109	1,742	87,145	88,996
	2014	115	1,842	92,167	94,124
	2019	127	2,019	101,191	103,337
SGR	2011	14,446	10,862	44,546	69,854
	2014	14,777	11,110	43,683	69,570
	2019	15,586	11,719	45,000	72,305
T00	2011	56	176	2,768	3,000
	2014	60	191	2,983	3,234
	2019	68	216	3,379	3,663
T41	2011	73	1,459	79,758	81,287
	2014	78	1,561	85,471	87,110
	2019	88	1,751	95,918	97,757
TME	2011	1,274	1,576	6,150	9,000
	2014	1,373	1,699	6,630	9,702
	2019	1,447	1,789	7,753	10,989
54T	2011	39	471	8,790	9,000
	2014	42	507	9,477	10,026
	2019	48	574	10,734	11,356

Note: Totals and subtotals may not match exactly due to rounding
Source: Flight Plan Data from National Offload Program, (Mitre Corp.); FAA ATADS (2011) and TAF (2012); HMMH Analysis

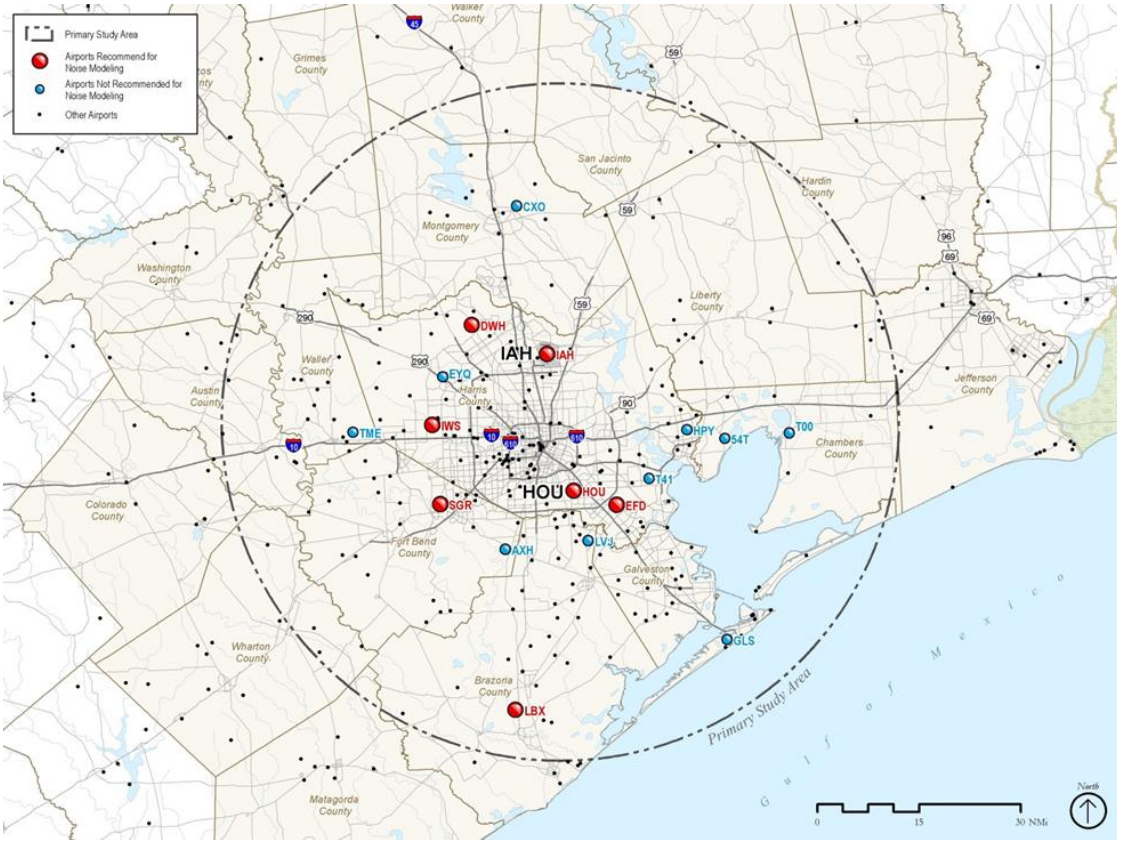
All runways at the Analyzed Airports were assumed to be available for aircraft traffic in NIRS. Standard approach angles of three degrees were used for the arrivals at all airports. Table 5 lists the airports and the runways that were modeled and Figure 3 shows a visual depiction of the airports in the study area. The airport elevation for IAH at 95 feet MSL was selected as the NIRS study elevation for the analysis.

Table 5 Modeled Airports and Runways

Airport	State	Name	Modeled Runways			
			Runway	Latitude	Longitude	Elevation (ft MSL)
Major:						
IAH	TX	George Bush Intercontinental/Houston	8L	N30.007161	W95.358791	92
			26R	N30.007183	W95.330358	95
			8R	N29.993416	W95.354964	96
			26L	N29.993439	W95.325265	94
			9	N29.977593	W95.334109	92
			27	N29.977613	W95.302526	86
			15L	N29.987890	W95.357869	96
			33R	N29.958764	W95.340052	86
			15R	N29.987806	W95.361398	97
			33L	N29.963541	W95.346550	88
HOU	TX	William P. Hobby	4	N29.639110	W95.285322	42
			22	N29.654158	W95.268712	39
			12L	N29.652607	W95.283871	45
			30R	N29.642782	W95.272203	40
			12R	N29.650934	W95.285511	45
			30L	N29.636424	W95.268285	42
			17	N29.652361	W95.284666	45
			35	N29.635866	W95.284318	43
Satellite:						
DWH	TX	David Wayne Hooks Memorial	17L	N30.063927	W95.552413	150
			35R	N30.053051	W95.550844	144
			17R	N30.073313	W95.554813	150
			35L	N30.054195	W95.552019	145
EFD	TX	Ellington Field	4	N29.598175	W95.162988	26
			22	N29.614040	W95.145547	30
			17L	N29.618469	W95.156209	31
			35R	N29.605798	W95.155917	30
			17R	N29.618333	W95.164393	31
			35L	N29.593588	W95.163820	27
IWS	TX	West Houston	15	N29.823102	W95.675269	111
			33	N29.813277	W95.669938	109
LBX	TX	Texas Gulf Coast Regional	17	N29.118267	W95.462108	25
			35	N29.099018	W95.462082	24
SGR	TX	Sugar Land Regional	17	N29.633210	W95.657569	82
			35	N29.611287	W95.655499	74

Source: FAA Forms 5010: Airport Master Record (February 9, 2012)

Figure 3 Houston OAPM Study Area Airports



4.2 Meteorological Conditions

NIRS has several settings that affect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include average annual temperature, barometric pressure, and relative humidity at the airport. For this analysis, recorded hourly data for each day in calendar year 2011 were obtained from the National Climatic Data Center (NCDC)[23] and used to determine the annual average weather conditions in the Houston area. Table 6 summarizes the weather data used for the NIRS analysis.

Table 6 Environmental Variables

Variable	Annual Average
Temperature (ºF)	69.8
Atmospheric Pressure (in-HG)	30.02
Relative Humidity (%)	71.5
Source: NCDC Dataset TD 3505; HMMH Analysis	

[23] NCDC TD 3505 - Integrated Surface Data Hourly Surface Weather Data, downloaded 2/6/2012 from http://www.ncdc.noaa.gov/oa/documentlibrary/surface-doc.html#3505

4.3 Aircraft Operations Levels and Day/Night Distribution

IFR operation levels for each Analyzed Airport were based on 36 – 24 hour samples of 2011 flight track data (Table 2) combined with 2011 calendar year IFR flight plan data[24]. These data were supplemented with 2011 Air Traffic Activity System (ATADS) data and 2012 FAA TAF data to derive the total IFR operations for years 2012, 2014, and 2019. The IFR operation totals modeled for the Houston OAPM EA are presented in Table 7 and

Table 10. The Visual Flight Rules (VFR)[25] aircraft operations were not included in the analysis because these operations would not be affected by the Proposed Action. The VFR operations are shown because they assist with illustrating how the forecast IFR operations were developed from the TAF.[26]

IAH and HOU forecasts were scaled to the aircraft categories presented in both ATADS and TAF.[27] Table 8 shows how the operations from the TAF were subdivided for IFR and VFR. The 2019 forecast for HOU was adjusted for an estimated increase in operations (at HOU) associated with the proposed Federal Inspection Services and terminal expansion. This project was announced after the FAA published the 2012 TAF. The incremental increase in operations was based on the report prepared for Houston Airport System.[28] The report prepared two forecasts – the "Initial Phase Scenario" and the "Developed Phase Scenario". The Developed Phase Scenario has more operations and was used for the purposes of this analysis.[29]

Less data were available for the satellite airports and the forecasts use the same information used for the screening analysis discussed in Section 4.1 In some cases there are differences between Table 9 and Table 4. Table 4 is from flight plan data representing all calendar year 2011 and used for the satellite airport selection process. For the detailed analysis, actual flight tracks are needed (from the data in Table 2). In some cases the differences in the data sets could not be reconciled. An example of this is LBX – while calendar year 2011 data indicated there were some turbo-prop aircraft operations (Table 4) there were no such operations in the data set presented in Table 2. In these cases, operations were readjusted based on the data in Table 2. Table 9 presents the operations for the detailed analysis.

Table 10 summarizes the modeled IFR operations.[30]

The No Action and Proposed Action levels of operations are the same in each respective forecast year (e.g., No Action and Proposed Action operations for IAH in 2014 are 606,581).

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[24] Flight Plan Data and Radar Data from National Offload Program, (provided by Mitre Corp.)
[25] Visual Flight Rules - Rules that govern the procedures for conducting flight under visual conditions (FAA,Pilot-Controller Glossary, July 26, 2012) .
[26] The TAF presents total operations at an airport. It does not distinguish IFR versus VFR forecast. ATADS does distinguish IFR versus VFR forecast. All operations reported by the TAF as "Local" were counted as VFR.
[27] Air Carrier (AC), Air Taxi, (AT) General Aviation (GA) and Military are categories used in the TAF and ATADS
[28] Information provided on Houston Airport System (HAS) website. http://www.fly2houston.com/HobbyInternational, in particular "The Economic Impact of International Commercial Air Service at William P. Hobby Airport", a report dated May 9, 2012 and prepared by GRA, Incorporated and InterVISTAS Consulting LLC for the HAS.
[29] The "Developed Phase Scenario" is Exhibit 1-17. It specifically identifies 23 daily international departures. It also mentions 594,565 domestic connecting passengers and exhibit assumes 86 passengers per flight, which means there would be approximately 18.97 arrivals per day. Assuming passengers make the return trip through HOU, this equals 41.97 departures and 41.97 arrivals per day, or 30,639 additional operations per year. The TAF for HOU 2019 is 195,332.
[30] Totals from individual tables may not match due to rounding.

Table 7 2012 Base Year and Forecast Annual Operations by Airport

Airport	2012			2014			2019		
	Total[1]	IFR[2]	VFR[2,4]	Total[1]	IFR[2]	VFR[2,4]	Total[1,3]	IFR[2,3]	VFR[2,4]
IAH	559,910	557,474	2,436	609,095	606,581	2,514	720,217	717,523	2,694
HOU	205,815	180,871	24,944	209,643	184,172	25,471	253,191	225,971	27,220
EFD	144,702	21,571	123,131	144,702	21,571	123,131	144,702	21,571	123,131
DWH	181,172	22,460	158,712	183,106	22,837	160,269	188,078	23,808	164,270
IWS	105,957	14,041	91,916	109,007	14,222	94,785	117,020	15,260	101,760
LBX	81,456	5,279	76,177	85,091	5,373	79,718	94,948	5,976	88,972
SGR	68,519	25,343	43,176	69,570	25,887	43,683	72,305	27,305	45,000

Note: Totals and subtotals may not match exactly due to rounding

Sources:

1. FAA Terminal Area Forecast (TAF), January 2012, http://aspm.faa.gov/main/taf.asp

2. HMMH – Calculated values assuming ratios of IFR to VFR remain the same as they were in calendar year 2011 as reported by FAA Air Traffic Activity Data System, Calendar Year 2011 or FAA TAF for 2011 https://aspm.faa.gov/opsnet/sys/Main.asp?force=atads.

3. HMMH –Includes an estimated increase in operations associated with the proposed Houston Hobby (HOU) Terminal Building and other Facilities Expansion for Planned International Operations (construction of five additional gates for international flights and construction of a Federal Inspection Services facility at HOU). Information provided on Houston Airport System (HAS) website http://www.fly2houston.com/HobbyInternational, in particular "The Economic Impact of International Commercial Air Service at William P. Hobby Airport".", a report dated May 9, 2012 and prepared by GRA, Incorporated and InterVISTAS Consulting LLC for the HAS.

4. VFR totals include both VFR Itinerant and all Local operations as reported by TAF.

Table 8 Study Years Forecast Annual Aircraft Operations for IAH and HOU

Airport	Year	Aircraft Operations				
		IFR			VFR	Total
		Air Carrier	Air Taxi	GA/Military		
IAH	2012	297,353	249,247	10,874	2,436	559,910
	2014	328,364	267,278	10,939	2,514	609,095
	2019	397,396	309,024	11,103	2,694	720,217
HOU	2012	108,255	26,114	46,502	24,944	205,815
	2014	109,990	26,893	47,289	25,471	209,643
	2019	146,853	29,798	49,320	27,220	253,191

Notes: Air Carrier (AC), Air Taxi, (AT) General Aviation (GA) and Military are groups defined in the TAF
Totals and subtotals may not match exactly due to rounding

Source: Flight Plan Data and Flight Track from National Offload Program, (Mitre Corp.); FAA ATADS (2011) and TAF (2012); HMMH Analysis; HOU 2019 Air Carrier includes additional operations are associated with the proposed Houston Hobby (HOU) Terminal Building and other Facilities Expansion for Planned International Operations

Table 9 Study Years Forecast Annual Aircraft Operations for Satellite Airports

Airport	Year	Aircraft Operations				
		IFR			VFR	Total
		Jets	Turboprops	Props		
EFD	2012	13,507	1,834	6,230	123,131	144,702
	2014	13,507	1,834	6,230	123,131	144,702
	2019	13,507	1,834	6,230	123,131	144,702
DWH	2012	6,954	4,242	11,264	158,712	181,172
	2014	7,071	4,313	11,453	160,269	183,106
	2019	7,372	4,497	11,939	164,270	188,078
IWS	2012	1,232	4,054	8,754	91,916	105,957
	2014	1,248	4,107	8,867	94,785	109,007
	2019	1,340	4,407	9,514	101,760	117,020
LBX	2012	2,881	0	2,398	76,177	81,456
	2014	2,932	0	2,441	79,718	85,091
	2019	3,261	0	2,715	88,972	94,948
SGR	2012	14,466	3,625	7,252	43,176	68,519
	2014	14,777	3,703	7,408	43,683	69,570
	2019	15,586	3,906	7,814	45,000	72,305

Note: Totals and subtotals may not match exactly due to rounding
Source: Flight Plan Data from National Offload Program, (Mitre Corp.); FAA ATADS (2011) and TAF (2012); HMMH Analysis

Table 10 Modeled Annual IFR Operation Totals

Airport	2012	2014	2019
IAH	557,474	606,581	717,523
HOU	180,871	184,172	225,971
EFD	21,571	21,571	21,571
DWH	22,460	22,837	23,808
IWS	14,041	14,222	15,260
LBX	5,279	5,373	5,976
SGR	25,343	25,887	27,305

Notes: TAF for HOU 2019 is 195,332; additional operations are associated with the proposed Houston Hobby (HOU) Terminal Building and other Facilities Expansion for Planned International Operations
Totals and subtotals may not match exactly due to rounding
Source: Flight Plan Data from National Offload Program, (Mitre Corp.); FAA ATADS (2011); FAA TAF (2012); HMMH Analysis (2012)

The aircraft operations also consider the time of day distribution of operations, as the DNL noise metric weights nighttime noise events by an additional 10 dB (one nighttime flight equates to 10 daytime flights). The day and night distribution of operations at each Analyzed Airport was developed from the sample of radar data and then applied to the Average Annual Day (AAD) operational levels at each of the airports.[31] Table 11 depicts the overall operations distributed between 7:00 a.m. through 9:59 p.m. (Day)

[31] "Average Annual Day (AAD)" is a noise modeling metric used to normalize day-to-day variations in aviation operations over a one year period, calculated as the total number of annual operations divided by 365 (i.e., the number of days in a year).

and 10:00 p.m. through 6:59 a.m. (Night) for each airport. The No Action and Proposed Action day/night distributions are the same in each respective forecast year.

Table 11 Modeled Day/Night Distribution of AAD Operations

Airport	2012 Day	2012 Night	2014 Day	2014 Night	2019 Day	2019 Night
IAH	1,433.62	93.70	1,560.80	101.07	1,854.56	111.25
HOU	453.78	41.76	461.98	42.60	566.26	52.84
DWH	59.84	1.69	60.84	1.72	63.53	1.70
EFD	57.99	1.11	57.99	1.11	57.99	1.11
IWS	37.76	0.71	38.25	0.71	41.10	0.71
LBX	12.60	1.87	12.85	1.87	14.50	1.87
SGR	65.18	4.25	66.58	4.34	70.23	4.58

Note: Totals and subtotals may not match exactly due to rounding
Source: Flight Plan Data from National Offload Program, (Mitre Corp.)Flight Plan Data (Mitre Corp., 2011); FAA ATADS (2011); FAA TAF (2012); HMMH Analysis (2012)

4.4 Aircraft Fleet Mix

An aircraft fleet mix refers to the types of aircraft in operation at each airport. To develop the fleet mix for the Analyzed Airports, radar data were acquired and analyzed to determine aircraft types, time of day operations and origin/destination. The radar data samples were gathered using the National Offload Program and represented regional data for 36 24-hour periods between October 3, 2010 and September 26, 2011 (See Table 2). These periods covered different seasonal periods to reflect a good cross-section of yearly operations at the Analyzed Airports and to provide representative operations to reflect the average annual day of operations. These data included over 71,000 actual flight tracks.

For the future years, phase-out or phase-in of changes to the fleet mix were based on industry reports with regard to airline changes in aircraft types (e.g., phase out MD-80 series aircraft and some noisier general aviation jets and phase-in new technology aircraft like Boeing 787). Some older general aviation jets are phased out by 2015 and are not included in the 2019 forecast.[32] Growth of operations was forecasted to come from aircraft that are in production with out-of-production aircraft held at 2012 operational levels.

Table 12 and Table 13 present the forecasted fleet mixes for 2012, 2014, and 2019 for operations at the major airports and the satellite airports respectively.

Appendix B presents the aircraft types as used in the NIRS model showing the distributed average annual day operations.[33] Not all specific aircraft types that were present in the forecast are available aircraft types in the NIRS model. For those cases, a reasonable aircraft substitute was chosen based on noise characteristics and submitted to the FAA's Office of Environment and Energy Noise Division (AEE-100) for review and approval (correspondence included as Appendix A or this report). AEE-100 provided approval.[34]

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[32] This includes aircraft certified to 14 CFR Part 36, Stage 2. 14 CFR Part 36 describes noise certification of aircraft. Stage 2 aircraft are louder than Stage 3 aircraft of the same weight. 14 CFR Part 36 Stage 2 aircraft will typically not be allowed to operate in the continental United States after December 31, 2015 per the *FAA Modernization and Reform Act of 2012*.
[33] Unless otherwise noted, Appendix letters refer to an appendix of this report.
[34] AEE-100 recommended some changes to the substitution list and these were included in the modeling.

The Proposed Action would not affect the type of aircraft used at the Houston OAPM airports. Therefore the aircraft fleet mix tables are applicable for both the No Action and Proposed Action alternatives.

Table 12 Forecast Fleet Mix AAD Operations for Noise Modeling - IAH and HOU

Category	HOU			IAH		
	2012	2014	2019	2012	2014	2019
Jets	445.79	454.30	566.92	1,392.43	1,522.05	1,820.62
High-Performance Turboprops[1]	0.00	0.00	0.00	34.45	39.36	44.51
Turboprops and Props	49.74	50.28	52.18	100.45	100.46	100.69
Total	495.54	504.58	619.10	1,527.33	1,661.87	1,965.82

Note :1. High-performance turbo-prop is defined for this report as capable of greater than 280 knots.
Totals and subtotals may not match exactly due to rounding
Source: Flight Plan Data and Radar Data from National Offload Program, (Mitre Corp.); FAA ATADS (2011); FAA TAF (2012); HMMH Analysis (2012)

Table 13 Forecast Fleet Mix AAD Operations for Noise Modeling - Satellite Airports

Category	DWH			EFD			IWS		
	2012	2014	2019	2012	2014	2019	2012	2014	2019
Jets	19.05	19.37	20.20	37.01	37.01	37.01	3.38	3.42	3.67
High-Performance Turboprops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Turboprops and Props	42.48	43.19	45.03	22.09	22.09	22.09	35.09	35.54	38.14
Total	61.53	62.57	65.23	59.10	59.10	59.10	38.47	38.96	41.81

Category	LBX			SGR		
	2012	2014	2019	2012	2014	2019
Jets	7.89	8.03	8.93	39.63	40.48	42.70
High-Performance Turboprops	0.00	0.00	0.00	0.00	0.00	0.00
Turboprops and Props	6.57	6.69	7.44	29.80	30.44	32.11
Total	14.46	14.72	16.37	69.43	70.92	74.81

Note: Totals and subtotals may not match exactly due to rounding
Source: Flight Plan Data and Radar Data from National Offload Program, (Mitre Corp.); FAA ATADS (2011); FAA TAF (2012); HMMH Analysis (2012)

4.5 Runway Use

The primary factors determining runway use at an airport are generally the weather and prevailing wind conditions at the time of an aircraft operation. Additionally, several key secondary factors also have a strong influence on runway selection. These factors include runway safety issues, the current composition of the traffic (many arrivals or many departures), and even the flight's origin or destination. This latter factor is also based on safety from the standpoint that traffic is easier to sort on the ground (taxi for direction) than it is in the air.

It is important to note that within the context of all of these factors, the future runway use at an airport is, at best, an estimate. Simple changes over time, such as airlines changing the markets (destinations) that they serve, can have a notable effect on actual runway use in the future.

For the Analyzed Airports, the runway use for the future conditions was developed using two sources of data – the previously discussed radar data samples list in Table 2 and runway use data for calendar year 2011 from the Houston Airport System (HAS) for IAH and HOU. HAS – which manages the operations at IAH, HOU, and EFD – provided CY 2011 runway use data for IAH and HOU.[35] Both data sets were compared and the radar data sample was determined to be representative of the annual runway use conditions. While the HAS data were used for IAH and HOU runway use, the representative radar data were used for all other analyzed airports.

Airports typically operate their runways in certain configurations that are generally dependent on the prevailing winds as discussed above. As an example, IAH generally has two configurations for arriving and departing aircraft: (1) east flow and (2) west flow. East flow is characterized by primary arrivals on Runways 8L, 8R and 9 with departures on Runways 15L and 15R. West flow is characterized by primary arrivals on Runways 26L, 26R, and 27 with departures on Runways 15L and 15R. The airport configuration flows vary by seasonal conditions, time of day, local weather conditions, and aircraft traffic.

Appendix C present summaries of the AAD runway use tables for the modeled arrivals and departures. The summaries are based on the primary groups of aircraft by daytime and nighttime. A separate table is provided for each forecast year and airport. Runway use statistics for 2012, 2014 and 2019 are presented separately because there are minor differences in overall runway use between the three model years. The differences are due to subtle changes in aircraft growth rates based on the forecasts.

The Proposed Action would not affect how many aircraft land on each runway. Therefore the runway use tables are applicable for both the No Action and Proposed Action alternatives.

4.6 Aircraft Noise-Power-Distance (NPD) Curves

The NIRS model uses tables of sound exposure levels for specific aircraft and engines to calculate the varied sound level associated with the power setting of the engines and the distance from the engine to the observer. These tables are called noise-power-distance (NPD) curves. The model contains NPD curves for 225 aircraft-engine combinations. There is also a set of NPD curves for each operational mode of the aircraft – one set for arrivals and one set for departures. The standard NPD curves developed by the FAA for Release 7.0b.3 of NIRS were used in this analysis. Modification of existing NPD curves or creation of additional NPD curves requires AEE-100 approval and was not performed for this analysis.

The NPD curves are accessed during NIRS noise calculations to determine the noise levels at each population or grid location. The contribution of each aircraft operation assigned to a flight track is calculated at each population or grid location depending on the power setting for each flight segment in the track and the distance to the aircraft. The total noise exposure at each location is determined by combining the effects across all operations.[36, 37]

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[35] The Houston Airport System (HAS) provided the FAA data regarding CY 2011 IAH and HOU operations. HAS had provided the same data to the Texas Commission on Environmental Quality (TCEQ) at an earlier date. The HAS data were used for IAH and HOU because they represented a complete calendar year and for consistency with HAS and TCEQ analysis and reports.

[36] NIRS User's Guide, Version 7.0b.2, Federal Aviation Administration, Washington D.C. February 2012; the NIRS User's Guide, Version 7.0b.2, is also the User Guide for NIRS Version 7.0.b.3,

[37] INM Technical Manual, Version 7.0. Federal Aviation Administration, Washington D.C. January 2008

4.7 Aircraft Stage Length

NIRS uses stage length as a means to estimate the aircraft weight on departure. Aircraft weight is required to determine the climb performance profile of the aircraft on departure. Stage length is the term used in NIRS to refer to the length or distance of the complete nonstop flight planned for each departure operation from origin to destination. The flight distance influences the take-off weight of the aircraft as more fuel is required to go greater distances. Aircraft weight is a factor in the aircraft's thrust and performance. The great-circle distance is used to calculate a stage length for each aircraft operation. Great-circle distance is the shortest distance between any two points on the surface of a sphere (earth) measured along the path on the surface of the earth. Nine categories for departure stage length and one for arrival stage length are used in NIRS, as shown in Table 14.

Table 14 Stage Length and Trip Distance

Stage Length Category	Approximate Trip Distance (nm)
Departures:	
D-1	0 - 500
D-2	500 - 1,000
D-3	1,000 - 1,500
D-4	1,500 - 2,500
D-5	2,500 - 3,500
D-6	3,500 - 4,500
D-7	4,500 - 5,500
D-8	5,500 - 6,500
D-9	Greater than 6,500
Arrivals:	
A-1	Any Distance (3º Approach)
Source: NIRS; FAA INM 7.0 Technical Manual	

NIRS does not have all stage lengths available for all aircraft. In cases where the stage length was not available or exceeded the maximum stage-length profile available for that runway (i.e., the aircraft would not over run the runway on departure), the maximum stage length available was selected.[38]

Table 15 presents the number of departures, by stage length for the analyzed airports. The Proposed Action would not affect the destination of aircraft. Therefore the number of operations by stage length is applicable for both the No Action and Proposed Action alternatives.

[38] For process efficiency, INM 7.0b was used to determine which profiles would cause overruns. INM 7.0b uses the same initial take-off roll performance equations as NIRS. INM logs were easier to parse for this application.

Table 15 Average Annual Day Departure Stage Length Assignments for Noise Modeling

Category	HOU			IAH		
	2012	2014	2019	2012	2014	2019
D-1	419.84	427.44	512.53	1,046.42	1,123.36	1,320.89
D-2	55.05	57.02	78.13	300.71	312.35	346.28
D-3	20.65	20.96	29.26	132.32	142.96	164.78
D-4	0.00	0.00	0.00	28.07	28.91	32.51
D-5	0.00	0.00	0.00	3.56	3.59	3.72
D-6	0.00	0.00	0.00	12.08	11.38	38.96
D-7	0.00	0.00	0.00	2.50	2.71	19.01
D-8	0.00	0.00	0.00	1.21	1.39	1.56
D-9	0.00	0.00	0.00	0.46	0.46	0.46
Total	495.54	505.42	619.92	1,527.33	1,627.11	1,928.17

Category	DWH			EFD			IWS		
	2012	2014	2019	2012	2014	2019	2012	2014	2019
D-1	61.42	61.76	64.50	58.39	58.06	58.06	38.47	38.58	41.43
D-2	0.08	0.08	0.08	0.44	0.44	0.00	0.00	0.00	0.00
D-3	0.03	0.03	0.03	0.27	0.27	0.00	0.00	0.00	0.00
D-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	61.53	61.87	64.62	59.10	58.78	58.06	38.47	38.58	41.43

Category	LBX			SGR		
	2012	2014	2019	2012	2014	2019
D-1	12.57	10.98	12.40	69.05	67.68	71.42
D-2	0.00	0.00	0.00	0.35	0.35	0.35
D-3	1.90	1.93	2.16	0.04	0.03	0.03
D-4	0.00	0.00	0.00	0.00	0.00	0.00
D-5	0.00	0.00	0.00	0.00	0.00	0.00
D-6	0.00	0.00	0.00	0.00	0.00	0.00
D-7	0.00	0.00	0.00	0.00	0.00	0.00
D-8	0.00	0.00	0.00	0.00	0.00	0.00
D-9	0.00	0.00	0.00	0.00	0.00	0.00
Total	14.46	12.91	14.56	69.43	68.07	71.81

Note: Totals and subtotals may not match exactly due to rounding
Source: Flight Plan Data and Radar Data from National Offload Program, (Mitre Corp.); FAA ATADS (2011); FAA TAF (2012); HMMH Analysis (2012)

4.8 Flight Track Definitions

To determine projected noise levels on the ground, it is necessary to determine the frequency of aircraft operations and the position of the aircraft in space (laterally or along the ground and vertically or altitude). Flight tracks to and from an airport are generally a function of the geometry of the airport's runways and procedures used to manage traffic. For this analysis, an extensive effort was undertaken to ensure an accurate portrayal of aircraft locations both near the major airports and to the extent of the SSA. Model tracks were developed 10 nautical miles beyond the SSA to allow noise modeling calculations at the edge of the SSA to include noise energy from aircraft operations slightly beyond the point on the ground.

A comprehensive analysis of radar data was completed, including an evaluation of 36 days of acquired FAA radar data (Table 2) using proprietary software. The radar sample between October 3, 2010 and September 26, 2011 was analyzed for operations encompassing the seven Analyzed Airports. This detailed information allowed for the development of a database of flight tracks for the noise modeling effort representing AAD conditions. Individual flight tracks were taken directly from the radar system and converted into NIRS input model tracks. This provided the advantage of modeling each aircraft operation on the specific runway it actually used, at the actual time of day of the arrival or departure. Because the sample radar data included only 36 days, operations on the specific flight tracks were scaled to the AAD operations levels. The No Action model track geometry remains unchanged compared to the Existing Condition model tracks, although the selection of tracks used between 2012, 2014 and 2019 varied as aircraft were phased out or phased in.[39]

For the Proposed Action it was assumed that all aircraft equipped to operate using area navigation (RNAV) technology would use the proposed RNAV procedures. The Proposed Action includes conventional (non-RNAV) procedures, and it was assumed that all non-RNAV aircraft would use the proposed conventional procedure. RNAV is a method of IFR navigation that allows an aircraft to choose any course within a network of navigation beacons rather than navigating directly to and from the beacons. Area navigation used to be called "random navigation", thus the acronym RNAV. RNAV procedures are comprised of several different turn types and leg segments. These are defined in various industry documents and the FAA Aeronautical Information Manual.[40] The sections below provide an overview of the RNAV segment types used in the FAA's proposal for the Houston OAPM.

No Action flight tracks were associated to a Proposed Action procedure by equipage (RNAV vs non-RNAV), aircraft category (jet, high performance turbo-prop, turbo-prop, piston prop) and the original flight track geometry (location that the original aircraft entered/exited TRACON's airspace). Appendix D includes Figures D-1 through D-10. These figures compare the No Action and Proposed Action procedures and model tracks.

Figure D-1 presents all of the No Action alterative model flight tracks used for the 2014 analysis. Figure D-2 presents all of the Proposed Action alternative model flight tracks used for the 2014 analysis. In both figures, there are over 71,000 individual flight tracks. Figures D-3 through D-10 present subsets of the model tracks shown in Figures D-1 and D-2. Figures D-3 through D-6 show IAH model tracks, Figures D-7 and D-8 show HOU model tracks, and Figures D-9 and D-10 show the satellite airport (DWH, EFD, IWS, LBX, SGR) model tracks. These are described in the sections below.

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[39] In particular, operations associated with proposed international operations at HOU in the forecast year 2019. This added additional No Action model tracks to the south over Galveston (using the SCHOLES SID), relative to 2012 Existing Condition tracks and 2014 No Action tracks.
[40] http://www.faa.gov/air_traffic/publications/atpubs/aim/

Appendix E presents tables with the number of operations by the Proposed Action procedures for an AAD. The tables are sorted by airport and by forecast year. The proposed procedure names in the tables are the same as those shown in the Proposed Action side of Appendix D figures. The tables provide the total number of operations by procedure and the number of operations by runway. The sections below provide additional explanation of flight track development, operation assignment, Appendices D and E.

4.8.1 Proposed Action Departures

The proposed RNAV SIDs[41] would replace the existing SIDs with one SID maintained for each north, south, east, and west direction for conventional aircraft departures (those not RNAV equipped). Each RNAV SID overflies a waypoint located either east, west, north, or south of the Houston metroplex. Information about each of the new RNAV SIDs can be found in Houston OAPM Design and Implementation Team materials.[42]

The initial departure segment defines the way an aircraft departs the runway and reaches its first location. The initial segment design is affected by a variety of parameters including aircraft performance limitations, obstacles that maybe in the surrounding area of the airport, and proximity to other airports.

The Proposed Action includes two different types of initial departure segments. “RNAV off-the-ground” departure segments are proposed for departures for IAH Runways 15L and 15R to the east, west and south. Radar vectors are proposed for all other airport runways (IAH, HOU, and satellite airports) and for IAH Runways 15L and 15R to the north.[43] These two types of initial departure segments are described below.

The Proposed Action alternative includes “RNAV off-the-ground” departures for IAH Runways 15L and 15R to the east, west and south. The proposed RNAV off-the-ground instructions for IAH Runways 15L and 15R start with an initial segment called “VA-DF”[44]. The aircraft is instructed to take-off and maintain runway heading, but the aircraft flight path is not corrected for crosswind. Then, at a specified altitude, the aircraft turns directly to the next fix (waypoint). Typically the specified altitude for the IAH departures on Runways 15L and 15R is approximately 600 ft. MSL. Individual aircraft operations would reach this specified altitude at different locations (due to a variety of factors such as, but not limited to, aircraft performance and weight and headwinds). As a result, aircraft on the same runway and the same procedure may have variable locations for the start of the initial turn. For the Proposed Action model development, the actual flight tracks provided the location where aircraft following the RNAV off-the-ground instructions reach 600 ft. MSL and start the turn. However, the model tracks do not start the turn until passing the end of the runway.[45]

All other Proposed Action departures follow radar vectors to a common waypoint. This is effectively done in the Houston OAPM EA Existing Condition and No Action alternatives as well as in the Proposed

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[41] Standard Instrument Departure (SID): A preplanned instrument flight rule (IFR) air traffic control (ATC) departure procedure printed for pilot/controller use in graphic form to provide obstacle clearance and a transition from the terminal area to the appropriate en route structure. SIDs are primarily designed for system enhancement to expedite traffic flow and to reduce pilot/controller workload. ATC clearance must always be received prior to flying a SID. (FAA, Pilot-Controller Glossary, July 26, 2012.)
[42] Houston OAPM Design and Implementation Team documents are included in a separate appendix to the EA.
[43] Also known as “Vector Manual” or “VM” legs.
[44] VA = Heading-to-an-altitude; DF = Direct-to-fix (FAA Order 8260.46D, http://www.faa.gov/documentLibrary/media/Order/8260_46D.pdf)
[45] This assumption is consistent with the TARGETS 5.0 Flight Evaluator output. TARGETS is a software tool developed by The MITRE Corporation.

Action, although it may not be RNAV. No changes are expected, for instance, on departures from most runways where the pilot will receive a vector from air traffic control after takeoff to the first or succeeding waypoint on the departure procedure. The lowest altitude at which air traffic controllers will provide a vector varies by airport. For IAH and HOU, I90 can start to vector the aircraft at 3,000 ft. MSL. For the other analyzed airports (DWH, EFD, IWS, LBX, SGR), I90 can start to vector the aircraft at 2,000 ft. MSL. Prior to these respective altitudes, the Proposed Action and No Action tracks are identical.[46] Above that altitude, the Proposed Action model tracks can vary as aircraft are vectored (the tracks could be the same if the Proposed Action destination is similar to the No Action destination).

Figures D-5, D-6, D-8, and D-10 present the NIRS model tracks that were developed from radar data for the 36-day sample of radar departure tracks. These figures depict the model tracks for all seven Houston OAPM EA analyzed airports. The No Action departure procedures are presented on the left panel with the radar tracks and Proposed Action departure procedures on the right. There were 34,979 modeled departure flight tracks used for 2014 analysis. The tracks are shown over the base map of the area. As the tracks indicate, a number of commonly used departure routes are evident. Appendix E presents tables with the number of operations by the Proposed Action procedures for an AAD.

4.8.2 Proposed Action Arrivals

Each of the proposed new Standard Terminal Arrival procedures (STAR)[47] has been designed to include multiple segments: an en route transition, a common route, and a runway transition. For arrivals to IAH and HOU, there are multiple transitions that begin during the en route portion of flight. Each en route transition converges at the beginning of the common route, which terminates at a waypoint. The termination of the common route represents the point at which the runway transition segment begins, where the aircraft flight trajectory differs depending on the runway assignment. In this analysis, the PSA generally encompasses the flight trajectory once aircraft have begun the common route portion of the procedure.

The RNAV STARs represent a revised altitude structure that is designed to allow most aircraft to remain higher for longer periods of time. For example, IAH arrivals "long-side" arrivals remain higher, while "short-side" arrivals are lower. Long-side procedures are those that arrive in opposition to the operating flow of IAH at the time, and are thus required to utilize a downwind approach prior to turning to their final, straight-in approach. Many of the RNAV STARs are designed to include a transition to a runway, but not necessarily to guide the aircraft to the runway end. The RNAV STAR procedures designed for IAH, HOU, and the satellite airports begin when the aircraft is in the en route portion of flight, beyond the study area, and end at a point prior to the runway end. At any point along an RNAV STAR, an aircraft may exit the procedure and proceed to the runway via vectoring, or may transition to an available (and ATC-assigned) approach, such as an Instrument Landing System (ILS)[48] approach or a Required Navigation Procedure (RNP) Authorization Required (AR) approach.[49] For the Proposed Action

[46] For noise modeling purpose, the start of the track modification may have occurred slightly below the respective altitude.
[47] Standard Terminal Arrival (STAR): A preplanned instrument flight rule (IFR) ATC arrival procedure published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area. (FAA, Pilot-Controller Glossary, July 26, 2012.)
[48] An Instrument Landing System (ILS) is a ground-based navigation system that provides lateral and vertical course guidance, to facilitate landings during adverse weather conditions. (FAA, Pilot/Controller Glossary, July 26, 2012.)
[49] Required Navigation Performance (RNP) is a method of aircraft navigation that utilizes modern flight computers, GPS, and innovative new procedures to fly precisely predetermined paths loaded into aircraft computers. A RNP "Authorization Required" (AR) procedure is a type of Standard Instrument Approach Procedure (SIAP) that offers

modeling, aircraft vectoring were assumed to join runway centerline (in other words line up to the runway), for a final approach, in the same location as the respective No Action tracks.

Figures D-3, D-4, D-7, and D-9 the NIRS model tracks that were developed from present radar data for the 36-day sample of radar arrival tracks. These figures depict the model tracks Analyzed Airports. There were 36,518 arrival modeled flight tracks used for 2014 analysis. Appendix E presents tables with the number of operations by the Proposed Action procedures for an AAD.

The tables in Appendix E indicate the use of RNP AR or a proposed RNAV ILS transition. All operations marked "STAR" use vectoring to transition from the end of the RNAV STAR to the final approach. As noted in the tables, some of the noise modeling tracks include modifications relative to the Houston OAPM D&I materials. These modifications were done in consultation with the D&I team and reflect predicted operations.

The modifications relative to the Houston OAPM D&I materials include vectoring (or "shortcuts"). One of the most visible examples of vectoring occurs with the proposed KIDDZ STAR to HOU (Figure D-7) from the northwest. Existing (and No Action) arrivals to HOU from the northwest on the existing COACH STAR often receive vectors soon after entering TRACON airspace, over Waller County direct (or more direct) to HOU than if they remained on the COACH STAR through Fort Bend County (Figure D-7, left panel). Discussions with the D&I Team indicate that they expect this process to continue with the proposed KIDDZ STAR (Figure D-7, right panel). This is reflected in the tables in Appendix E, which show that for noise modeling, more operations were on the KIDDZ modification than would be expected to follow the whole length of the STAR.[50]

4.9 Aircraft Climb/Descent Profiles

To accurately model noise exposure, NIRS has the capability to include specified altitude restrictions incorporated in the flight track and aircraft operations data. The modeled aircraft trajectory in NIRS reflects altitude information provided by the air traffic procedure, rather than following an INM standard procedure profile, as is ordinarily done in INM studies. NIRS automatically generates profiles for each aircraft operation on each flight track that are consistent with the specified altitudes and the NIRS aircraft-performance database.

The altitude-following capability is only applied above altitudes of 3,000 ft. above the respective runway elevation. This means that for all flight tracks that contain points with altitudes greater than 3,000 ft. relative to the runway, the NIRS standard procedure profile will be used up to 3,000 ft. relative to the runway. At altitudes greater than 3,000 ft relative to the runway, the profile will follow the specified air traffic procedure design.

For the Existing Conditions and No Action scenarios, individual altitude profiles, based on actual flight track data, were prepared into standard NIRS format.

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the most benefit to users by allowing for predetermined, precise, curved flight paths that can reduce flight distances, conserve fuel, and preserve the environment. These procedures require specific aircraft functionality and pilot crew training.

[50] Tables labeled "HOU 2014 Average Annual Day Operations by Route and Runway" and "HOU 2019 Average Annual Day Operations by Route and Runway"

4.9.1 Proposed Action Climb/Descent Profiles

For the Proposed Action, each individual altitude profile followed the respective Proposed Action procedure where the proposed procedure provided altitude instructions and used the original actual flight track data where the proposed procedure did not provide altitude instructions. The original altitude profiles were modified in one of two ways in order to comply with the proposed procedure altitude instructions. (1) If the actual profile was higher than the proposed procedure's altitude instructions, the Proposed Action flight track effectively had a level flight segment added at the respective altitude. (2) If the original altitude profile was too low to satisfy the proposed procedure's altitude instructions, sections of the original altitude profile between the runway and the particular point were adjusted to create the new steeper altitude profile.[51] If the original altitude profile satisfied the proposed altitude, that segment was not modified. These inputs were prepared into standard NIRS format and all routes were checked by NIRS violations of general profile constraints, such as maximum climb and descent angles.

4.10 Modeling Locations

While the previous sections have discussed parameters that affect the noise source considered in this study, i.e. aircraft operations, this section discusses the various modeling locations, or noise receivers, for which aircraft noise exposure levels were computed using NIRS. These modeling locations represent noise sensitive land uses, or other locations of interest. For this study, several different types of locations were identified in the study area and these locations are represented by a total of 120,079 individual model points, represented by four distinct grid types: (1) U. S. Census centroids, (2) supplemental grids of regularly spaced points (3) potential Section 4(f) properties, and (4) historical and cultural locations. The model points are presented in Figure 4 and Figure 5. Figure 4 is sized to show the PSA while Figure 5 is sized to show the extent of the SSA.

[51] This process worked from the runway outward for both arrivals and departures. The "steeper" segments were done with the bounds of standard procedure design and shallower (less aggressive) of typical aircraft operations. Departures used a climb gradient of 500 ft per nautical mile, which is used for the design of many departure procedures. Arrivals used a 2.7 degree glide slope, slightly shallower than a 3 degree glideslope. All inputs were entered in the standard NIRS traffic file format and in no case did this process require non-standard modification of the NIRS standard database.

Figure 4 Modeling Locations - PSA

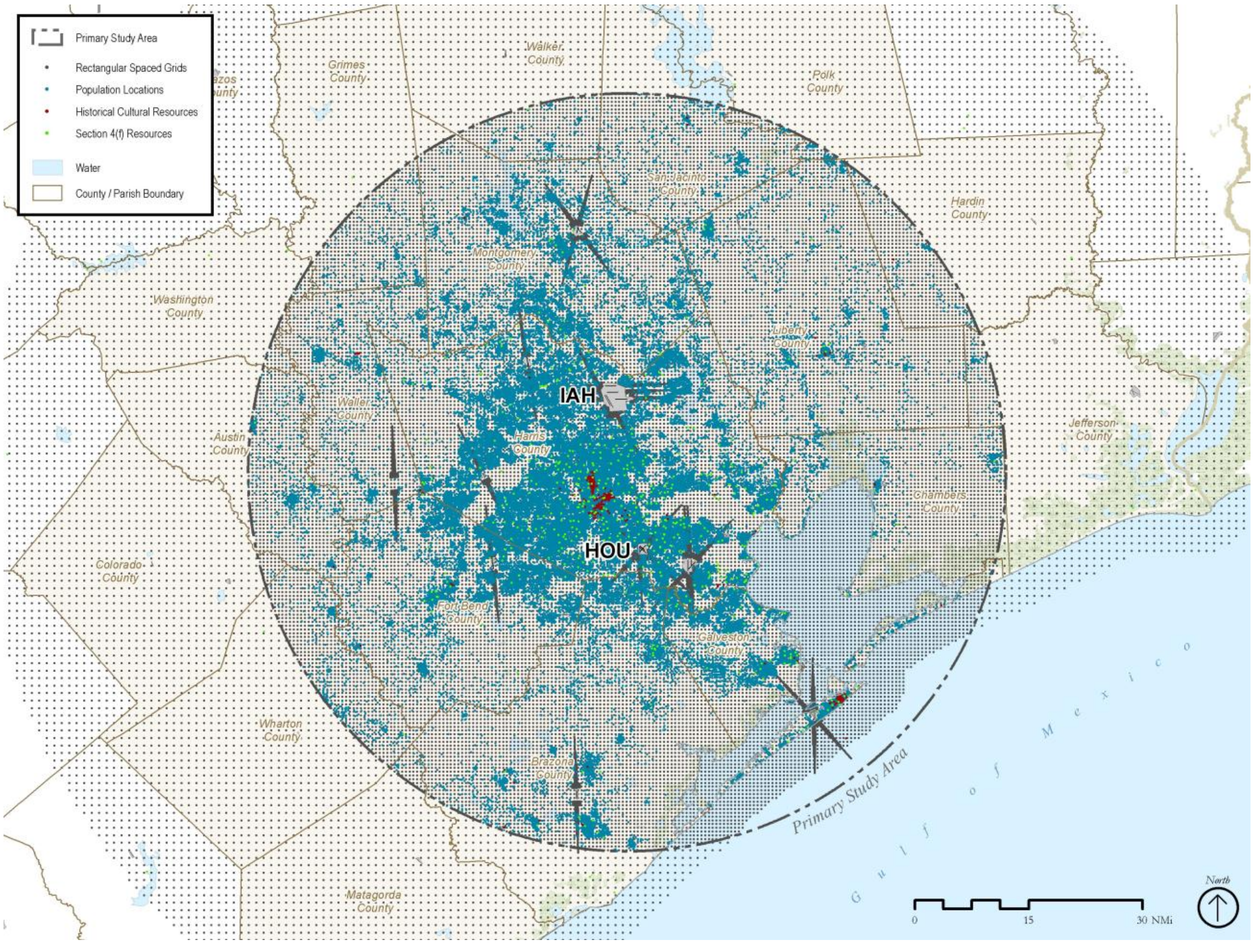
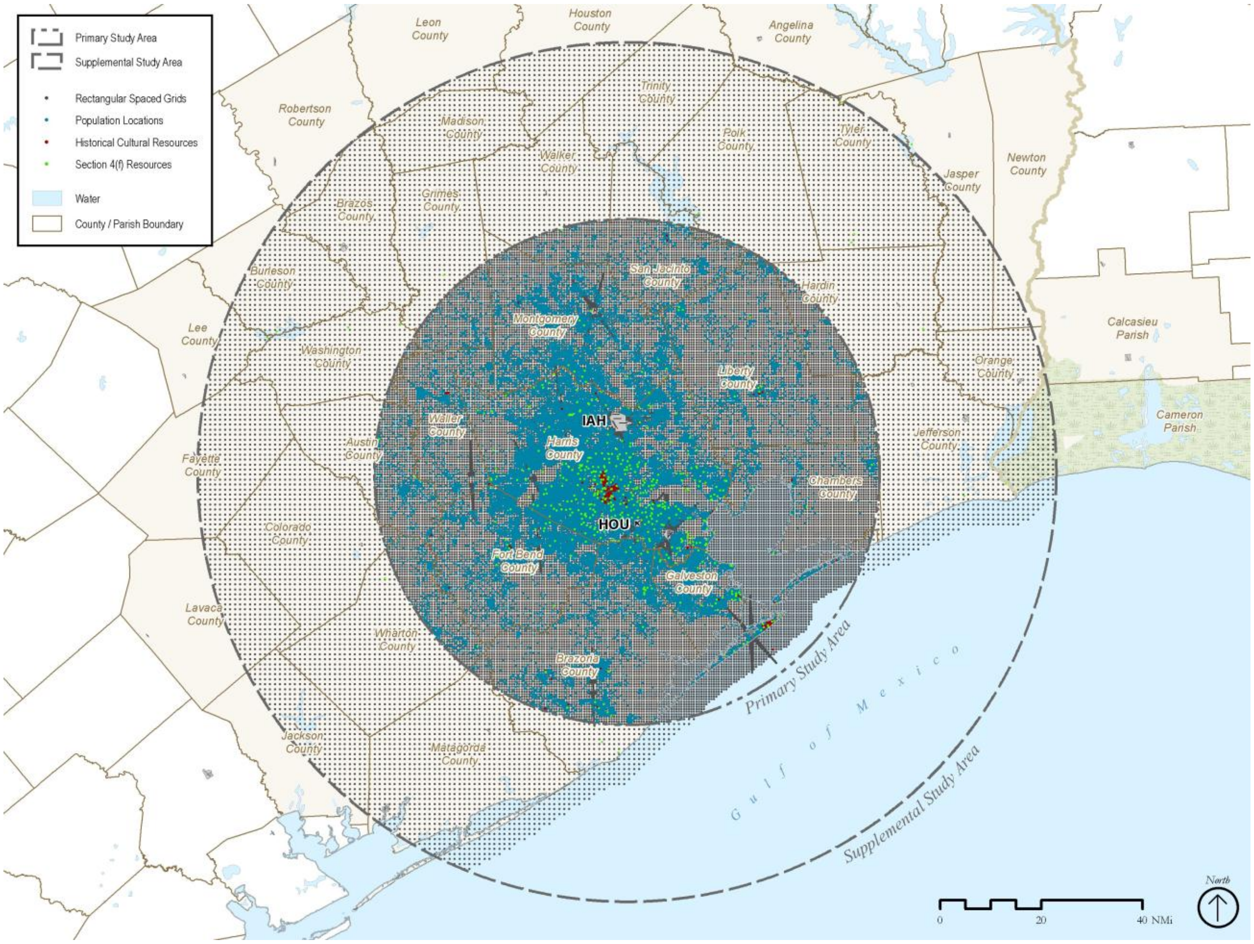


Figure 5 Modeling Locations - SSA



All model points were adjusted for elevation. Detailed terrain data for the entire Study Area was incorporated from the United States Geological Survey (USGS) 1-degree Digital Elevation Model (DEM) database for the U.S.[52] This database provides elevation data at ground points separated by 3 arc-seconds or approximately 90-meter (295 feet, almost the length of a football field, end-zone to end-zone) resolution. The elevation value for each point is provided at a resolution of one meter.

4.10.1 Population Data

Population locations were extracted from the 2010 U.S. Census data for the study area.[53] The census data were incorporated into the analysis at the smallest level of detail available. Known as census blocks,

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[52] Source: U.S Department of the Interior, U.S. Geological Survey, National Elevation Dataset; http://www.webgis.com/terr_us1deg.html May 15, 2012

[53] ftp://ftp2.census.gov/geo/pvs/tiger2010st/ United States Census (Census lock Centroids), July 24, 2012; United States Census (Census lock Groups), September 27, 2012;

these divisions represented the smallest area within the database where population data were defined. While census blocks vary in size, they tend to represent city block areas in urban zones, and larger areas in rural regions. The U.S. Census data also provided a centralized position within each block, known as a centroid, which was the single position used within each block for noise computation. A total of 67,184 population centroids, representing 5,936,898 people, were included in the population grid.

4.10.2 Regular Grids

Several sets of supplemental grids were developed to cover areas that might be of possible interest during post analysis. To supplement the population centroid and site-specific grid points discussed in other sections, two evenly spaced rectangular grids were setup to cover the PSA and SSA, respectively, with the grids centered on the study area center point. These two grids went out approximately 3 miles off shore, which was approximately the extent of the available terrain data. A third set of grid points was developed near individual runways.

The PSA grid is a set of points with approximately 3,000-ft. grid spacing (i.e., 3,000 ft. between centers of adjacent grid points) focused mostly on aircraft noise exposure levels associated with aircraft operations below 10,000 ft. AGL. This grid size ensured that no location within the PSA is more than 2,120 ft. from a modeled grid point (less than half a statute mile).

The SSA grid with an approximate 6,000-ft. grid spacing focused on identifying noise exposure levels for aircraft above 10,000 ft. AGL. This grid size ensured that no location within the SSA is more than 4,250 feet from a modeled grid point.

An additional set of grid points was developed near the runways. Each set had an additional triangular-shaped grid of approximately 200 points developed beginning 2,000 ft. off the end of each modeled airport's runways and approximately 3,000 ft. either side of the extended runway centerlines. The grid spacing extends out 7 nautical miles from each runway end.

4.10.3 Potential Section 4(f) Resources

Potential Department of Transportation (DOT) Section 4(f) resources are represented to determine whether any of these locations would experience reportable changes of aircraft noise under the Proposed Action. The location points for the Section 4(f) resources are located at the centroid of the property. For the larger parks or properties the PSA and SSA rectangular grids, discussed in Section 4.10.2, provided additional representative noise exposure levels at equal intervals within the properties. The inventory of potential Section 4(f) resources will be reported in a separate appendix to the Environmental Assessment for Houston Optimization of Airspace and Procedures in the Metroplex.

4.10.4 Historical and Cultural Resources

A list of historic and cultural resources grid point locations was developed from the National Register of Historic Places and from listings by the Texas Historical Commission. Multiple grid points were also associated with the Alabama-Coushatta Tribe of Texas Reservation. As indicated in the previous section, for the larger properties or historic districts, additional grid points from the rectangular grids would provide supplementary information on noise exposure levels. The inventory of historical and cultural resources will be reported in a separate appendix to the Environmental Assessment for Houston Optimization of Airspace and Procedures in the Metroplex.

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5 Noise Modeling Procedures

As described in Section 3 the FAA relied on NIRS to process the flight track and operation data and determine resulting noise levels for each of the Houston OAPM scenarios: (1) Existing Condition, (2) No Action in 2014, (3) Proposed Action in 2014, (4) No Action in 2019 and (5) Proposed Action in 2019. Key aspects of the NIRS input process, data integrity checks and output reports are discussed below.

5.1 NIRS Model Input

The input for the NIRS modeling effort was developed in accordance with the data, sources, and methodologies presented in the previous sections.

5.2 Data Integrity Checks

Before noise calculations are carried out, the NIRS pre-processor was run on all data components that contributed to the noise for a given annualized scenario. The resulting operation counts were checked against expected counts, and modeled fleet mix tables were reviewed for consistency with the noise modeling assumptions. Profiles and operations were checked during the same pre-noise calculations, and profiles that violate the following rules were flagged:

Flag Type	Rule
Climb/Descent	No angles greater than 30 degrees
Altitude Controls	There must be at least one altitude set above ground level
Aircraft	There must be an INM profile aircraft type
Runways	Assigned runways must be longer than aircraft takeoff distance

Track/aircraft combinations with flagged profiles were rejected by NIRS prior to noise calculations. Elements of the input data that failed the above tests or that were not readable due to format errors were reviewed and modified. If tracks were rejected, the remaining tracks were rescaled (i.e. operationally weighted) to effectively develop the desired total number of ops and runway use.

5.3 Develop Output Reports for Impact Analysis

After noise calculations were complete, noise results were exported and analyzed. The Proposed Action scenarios noise results for each of the 120,079 model points were associated with the respective No Action scenario results and compared to FAA criteria (Table 1). The data was prepared in a form that could be plotted by commercially available mapping tools.

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6 Results of Analysis

NIRS model analysis was conducted for each of the five scenarios: (1) Existing Conditions in 2012, (2) Forecast No Action in 2014, (3) Forecast Proposed Action in 2014, (4) Forecast No Action in 2019, and (5) Forecast Proposed Action in 2019. Noise results were tabulated based on the Proposed Action compared to the No Action Alternative at the previously described population centroids and supplemental grid points.

The following sections present both a summary of the NIRS input modifications made to model the Proposed Action and the results of the noise analysis for each scenario.

6.1 Existing and No Action

The following sections present the Existing conditions (2012) results and the future No Action results from the noise modeling. The future conditions are also developed for two No Action years representing the year of implementation (2014) and a future year five years beyond implementation (2019).

6.1.1 Existing and No Action Noise Model Inputs

For the Existing Conditions and No Action scenarios, the NIRS input was directly based on the radar data analysis presented in previous sections. With the exception of the operational levels and fleet mix, the model input for the 2014 No Action scenario is the same as the 2019 No Action scenario.[54]

6.1.2 Existing and No Action Noise Results

Consistent with FAA Order 1050.1E, the NIRS noise analysis focuses on aircraft noise exposure in areas affected by DNL 45 dB and greater.[55]

Table 16 provides the estimated population exposed to AAD DNL in ranges of 5 dB increments from DNL 45 dB to 75 dB, and the population exposed to DNL less than 45 dB and greater than 75 dB for the 2012 Existing Conditions, and 2014 and 2019 No Action scenarios.

For the 2012 Existing Conditions, an estimated 1,093,569 people within the PSA are expected to be exposed to noise levels of DNL 45 dB and greater due to aircraft noise. For the 2014 and 2019 No Action scenarios, the number of people exposed to aircraft noise of DNL 45 dB or greater is estimated to be 1,224,021 people and 1,366,418 people, respectively, all of which are in the PSA. These increases are due to the forecast increases in aircraft operations.

[54] The No Action flight tracks remain unchanged compared to the Existing condition flight tracks, although the selection of tracks used between 2012, 2014 and 2019 varied as aircraft were phased out or added.
[55] Reference FAA Order 1050.1E, Appendix A, paragraph 14.5e.

Table 16 Estimated Population Exposed to Aircraft Noise - Existing and No Action

DNL Range	Estimated Population Exposed to Aircraft Noise		
	2012 Existing	2014 No Action 2014	2019 No Action
Less than 45 dB	4,843,329	4,712,877	4,570,480
45 dB to less than 50 dB	708,672	806,553	871,244
50 dB to less than 55 dB	292,973	316,576	365,703
55 dB to less than 60 dB	79,632	87,747	111,095
60 dB to less than 65 dB	11,490	12,314	16,028
65 dB to less than 70 dB	792	821	2,338
70 dB to less than 75 dB	10	10	10
Greater than or equal to 75 dB	-	-	-
Source: NIRS, Census 2010			

The No Action noise levels were also computed for potential Section 4(f), historical and cultural sites.[56] In the SSA, all noise values are below DNL 45 dB.

Figure 6 presents a map of the 2012 Existing Conditions noise exposure at all of the modeling points within the study area.[57] The map is color coded based on the DNL increments presented in Table 16. As the Figure indicates, the noise levels due to air traffic throughout most of the study area are below DNL 45 dB. The higher noise levels indicated by the blue through red colors are concentrated in areas relatively close to each of the Analyzed Airports.

Figure 7 and Figure 8 show the calculated average daily noise exposure at all of the modeling points for the 2014 and 2019 No Action scenarios, respectively.[58]

6.2 Proposed Action

The 2014 and 2019 Proposed Action scenarios were modeled in NIRS. The Proposed Action includes multiple proposed RNAV (SID and STAR) procedures and RNP AR approaches and RNAV ILS transitions into IAH, an RNAV ILS transition into HOU, as well as a series of RNAV STAR and SID procedures for the five satellite airports. Each procedure was fully evaluated by the Design & Implementation Team through technical reviews.

Section 6.2.1 describes the design and assumptions associated with the Proposed Action and Section 6.2.2 presents the noise results.

6.2.1 Proposed Action Noise Model Inputs

Section 4.8 and Section 4.9 discuss the differences between the Proposed Action flight track definitions and climb/descent profiles compared to the No Action scenarios. All other model inputs, such as aircraft operations, day/night distribution, fleet mix and stage length, are the same as the No Action scenarios.

[56] Noise values for these locations were provided for respective analyses.
[57] Some areas of the SSA are not shown in the figures. All noise values in the SSA are below DNL 45 dB.
[58] Some areas of the SSA are not shown in the figures. All noise values in the SSA are below DNL 45 dB.

With the exception of the operational levels and fleet mix, the model input for the 2014 Proposed Action scenario is the same as the 2019 Proposed Action scenario.[59]

6.2.2 Proposed Action Noise Results

Figure 9 and Figure 10 show the calculated average daily noise exposure at all of the modeling points for the Proposed Action conditions in 2014 and 2019, respectively.[60] Table 17 summarizes the estimated affected population from less than DNL 45 dB to greater than DNL 75 dB in 5 dB increments for the 2014 and 2019 Proposed Action scenarios.

Table 17 Estimated Population Exposed to Aircraft Noise - Proposed Action

DNL Range	Estimated Population Exposed to Aircraft Noise	
	Proposed Action 2014	Proposed Action 2019
Less than 45 dB	4,699,857	4,562,565
45 dB to less than 50 dB	805,644	868,797
50 dB to less than 55 dB	332,078	377,201
55 dB to less than 60 dB	85,215	110,393
60 dB to less than 65 dB	13,286	16,417
65 dB to less than 70 dB	808	1,515
70 dB to less than 75 dB	10	10
Greater than or equal to 75 dB	-	-
Source: NIRS, Census 2010		

The Proposed Action noise levels were also computed for potential Section 4(f), historical and cultural sites.[61] In the SSA, all modeled noise values are below DNL 45 dB for the 2014 and 2019 Proposed Action scenarios.

6.3 Comparison of Proposed Action to No Action

This section provides the comparison of the Proposed Action scenarios to the No Action scenarios for the same timeframe.

6.3.1 2014 Proposed Action compared to 2014 No Action

Figure 11 illustrates the increase or decrease in noise exposure levels at each modeled location comparing the 2014 Proposed Action to the 2014 No Action and the criteria described in Table 1. Additionally, it illustrates areas where noise levels would increase by less than DNL 1.5 dB but move above or below DNL 65 dB.

No population centroid (or any other modeled location) would experience increases in noise exposure under the Proposed Action that would be considered significant (i.e., an increase in DNL of 1.5 dB or greater in an area exposed to noise of DNL 65 dB or more). Nor would any population centroid (or any

[59] The Proposed Action track geometry remains unchanged for the 2014 and 2019 Proposed Acton scenarios, although the selection of tracks used between 2014 and 2019 varied as aircraft were phased out or added.
[60] Some areas of the SSA are not shown in the figures. All noise values in the SSA are below DNL 45 dB.
[61] Noise values for these locations were provided for respective analyses.

other modeled location) be exposed to reportable noise increases between DNL 60 dB and 65 dB because of the Proposed Action.

Twenty-two people, represented by a single population centroid would experience a DNL 5 dB increase between DNL 45 dB to 60 dB in 2014 because of the Proposed Action. Three additional modeling points (not associated with population) would also experience such an increase. As depicted in Figure 11, Inset 2, the aforementioned population centroid and three additional modeling points (not associated with population) are located in Liberty County approximately five statute miles south of Dayton center. The points are located between Route 146 and Farm-to-Market (FM) 1409, and north of FM 1413.

In areas exposed to aircraft noise of DNL 65 dB and higher, the 2014 changes in noise exposure at census block centroids resulting from the Proposed Action, compared to the 2014 No Action, range from a decrease of DNL 0.1 dB to an increase of DNL 0.2 dB. In areas exposed to aircraft noise from DNL 60 dB to 65 dB, the changes at census block centroids resulting from implementation of the Proposed Action range from a decrease of DNL 0.9 dB to an increase of DNL 0.5 dB. In areas exposed to aircraft noise from DNL 45 dB to 60 dB, changes in noise exposure at census block centroids range from a decrease of DNL 3.1 dB to an increase of DNL 5.0 dB.

For 2014 several modeling points (not associated with population) would be newly exposed to DNL 65 dB or greater because of the Proposed Action. However, the noise increase would be well below DNL 1.5 dB and therefore would not be significant. Figure 11, Inset 3 depicts this location southwest of Garden City Park.[62] The maximum increase in DNL attributable to the Proposed Action at these modeling points would be only 0.5 dB. Thirteen people, represented by a single census centroid located on the south side of HOU, would have a DNL 0.1 dB decrease as a result of the Proposed Action, also depicted in Figure 11, Inset 3. Figure 11, Inset 1 depicts additional locations (not associated with population) around IAH that would move above or below DNL 65 dB. These locations would not experience a noise increase of DNL 1.5 dB or more.

6.3.2 2019 Proposed Action compared to 2019 No Action

Figure 12 illustrates the increase or decrease in noise exposure levels at each modeled location comparing the 2019 Proposed Action to the 2019 No Action and the criteria described in Table 1. Additionally, it illustrates areas where noise levels would increase by less than DNL 1.5 dB but move above or below DNL 65 dB as a result of the Proposed Action ("newly exposed" or "no longer exposed").

No population centroid (or any other modeled location) would experience increases in noise exposure under the Proposed Action that would be considered significant (i.e., an increase in DNL of 1.5 dB or greater in an area exposed to noise of DNL 65 dB or more as a result of the Proposed Action). Nor would any population centroid (or any other modeled location) be exposed to reportable noise increases between DNL 60 dB and 65 dB because of the Proposed Action.

Four hundred five people would experience a DNL 5 dB or greater increase between DNL 45 dB to 60 dB in 2019 because of the Proposed Actions. The locations of these increases are depicted in Figure 12, Inset 2. Additional model grid points indicate that the noise change occurs over a region approximately 13 statute miles long, south of U.S. Highway (US) 90. Depicted in Figure 12 Inset 2, this location is 6-10 mi. south of Liberty, extending from FM 1409 in the southwest to FM 770 in the southeast. Most of the affected population centroids are slightly north of the intersection of FM 1409 and County Road (CR) 450.

[62] Noise values for Garden City Park are below DNL 61 dB for all five scenarios modeled in this analysis. The complete set of potential Section 4(f) noise values are included a separate appendix to the EA.

In areas exposed to aircraft noise of DNL 65 dB and higher, the changes in noise exposure at census block centroids resulting from implementation of the 2019 Proposed Action are DNL 0.4 dB or less compared to the 2019 No Action. In areas exposed to aircraft noise from DNL 60 dB to 65 dB, the changes at census block centroids resulting from implementation of the Proposed Action range from a decrease of DNL 0.8 dB to an increase of DNL 0.8 dB. In areas exposed to aircraft noise from DNL 45 dB to 60 dB, changes in noise exposure at census block centroids range from a decrease of DNL 1.7 dB to an increase of DNL 8.7 dB.

For 2019, 58 people (represented by one population centroid) would be newly exposed to DNL 65 dB or greater because of the 2019 Proposed Action. This point, and two other points not associated with a population centroid, are located just southwest of the Robert C. Stuart Park to the northwest of HOU.[63] However, these noise increases would be well below DNL 1.5 dB and therefore would not be significant. The maximum increase in DNL attributable to the Proposed Action at this location would be only 0.2 dB. Such changes are extremely small and would be unlikely to be noticed. Two centroids just to the west, representing 95 people, would be exposed to DNL 65 dB or greater under the No Action Alternative and would reduce to less than DNL 65 dB in the Proposed Action. A separate modeling location, not associated with population, to the southwest of HOU would be newly exposed to DNL 65 dB or greater. The three previously described locations are all depicted in Figure 12, Inset 3.

Figure 12, Inset 1 depicts locations around IAH that would move above or below DNL 65 dB. Two population centroids would move below DNL 65 dB as a result of the Proposed Action – one to the west of the airport and east of Rt. 548, representing 83 people, and the second to the east of the airport and approximately three-quarters of a mile west of Rt. 59, representing 703 people. There are locations, shown in Figure 12, Inset 1, to the south of IAH, and north of Sam Houston Parkway, that would be newly exposed to DNL 65 dB or greater because of the 2019 Proposed Action. Aerial photography indicates that the other locations in with noise changes are commercial, industrial, or vacant. Moreover, none of these locations would experience a noise increase of DNL 1.5 dB or more.

[63] Noise values for Robert C. Stuart Park are below DNL 60 dB for all five scenarios modeled in this analysis. The complete set of potential Section 4(f) noise values are included a separate appendix to the EA.

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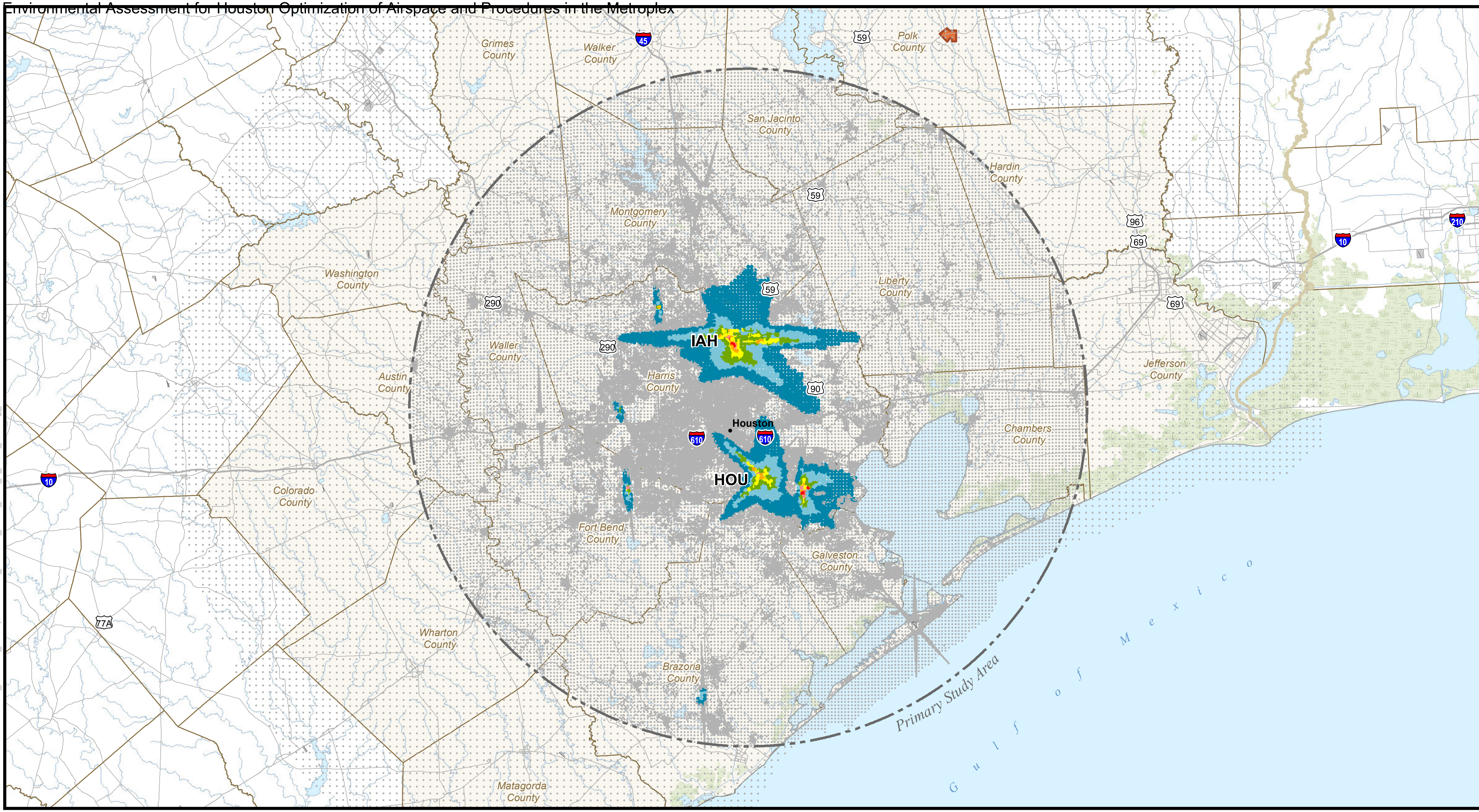

Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated); National Atlas (Tribal Land/Wilderness Areas), February 08, 2012;

Prepared By: Harris Miller Miller & Hanson Inc., December, 2012

North

0 10 20 Nautical Miles

Primary Study Area
Airport Boundary
State Boundary
County/Parish Boundary

Interstate Highway
Highways
Secondary Roads
Water
River/Stream
Alabama-Coushatta Tribe of Texas Reservation

2012 Existing DNL Levels

- DNL < 45.0 dB
- DNL 45.0 - 50.0 dB
- DNL 50.0 - 55.0 dB
- DNL 55.0 - 60.0 dB
- DNL 60.0 - 65.0 dB
- DNL 65.0 - 70.0 dB
- DNL 70.0 - 75.0 dB
- DNL > 75.0 dB

2012 Base Year Aircraft Noise Exposure at All Modeled Points

Figure 6

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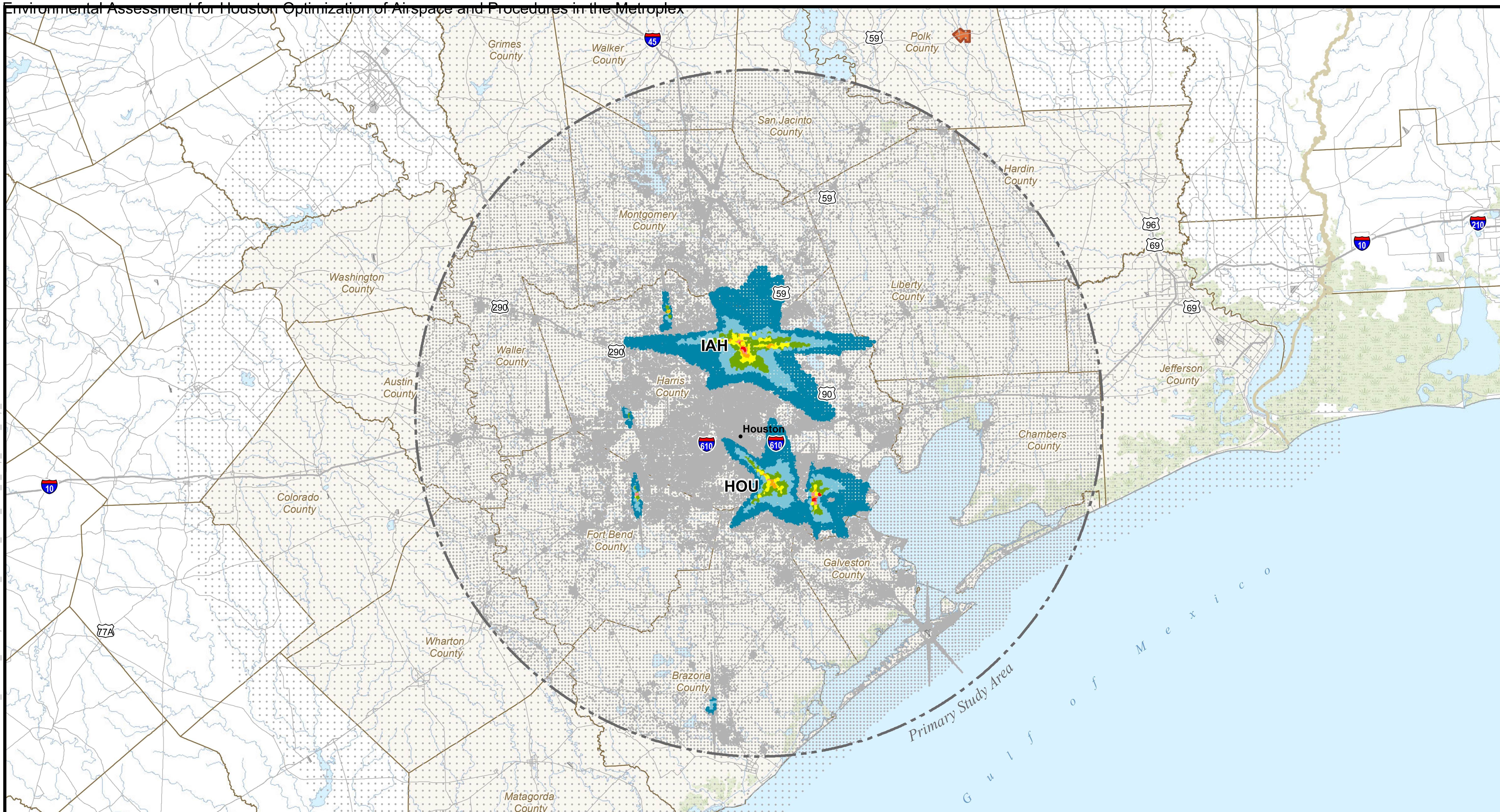

Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated); National Atlas (Tribal Land/Wilderness Areas), February 08, 2012;

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Primary Study Area
Airport Boundary
State Boundary
County/Parish Boundary
Interstate Highway
Highways
Secondary Roads
Water
River/Stream
Alabama-Coushatta Tribe of Texas Reservation

2014 No Action DNL Levels
- DNL < 45.0 dB
- DNL 45.0 - 50.0 dB
- DNL 50.0 - 55.0 dB
- DNL 55.0 - 60.0 dB
- DNL 60.0 - 65.0 dB
- DNL 65.0 - 70.0 dB
- DNL 70.0 - 75.0 dB
- DNL > 75.0 dB

North
0 10 20 Nautical Miles

All Modeled Points Exposed to Aircraft Noise
No Action, 2014

Figure 7

HARRIS MILLER MILLER & HANSON INC.

Path: H:\GIS\USA\TX\305220_Houston_Metroplex\305220_Houston_Metro_NTR_7_Pop_Noise_Exp_2014NA.mxd

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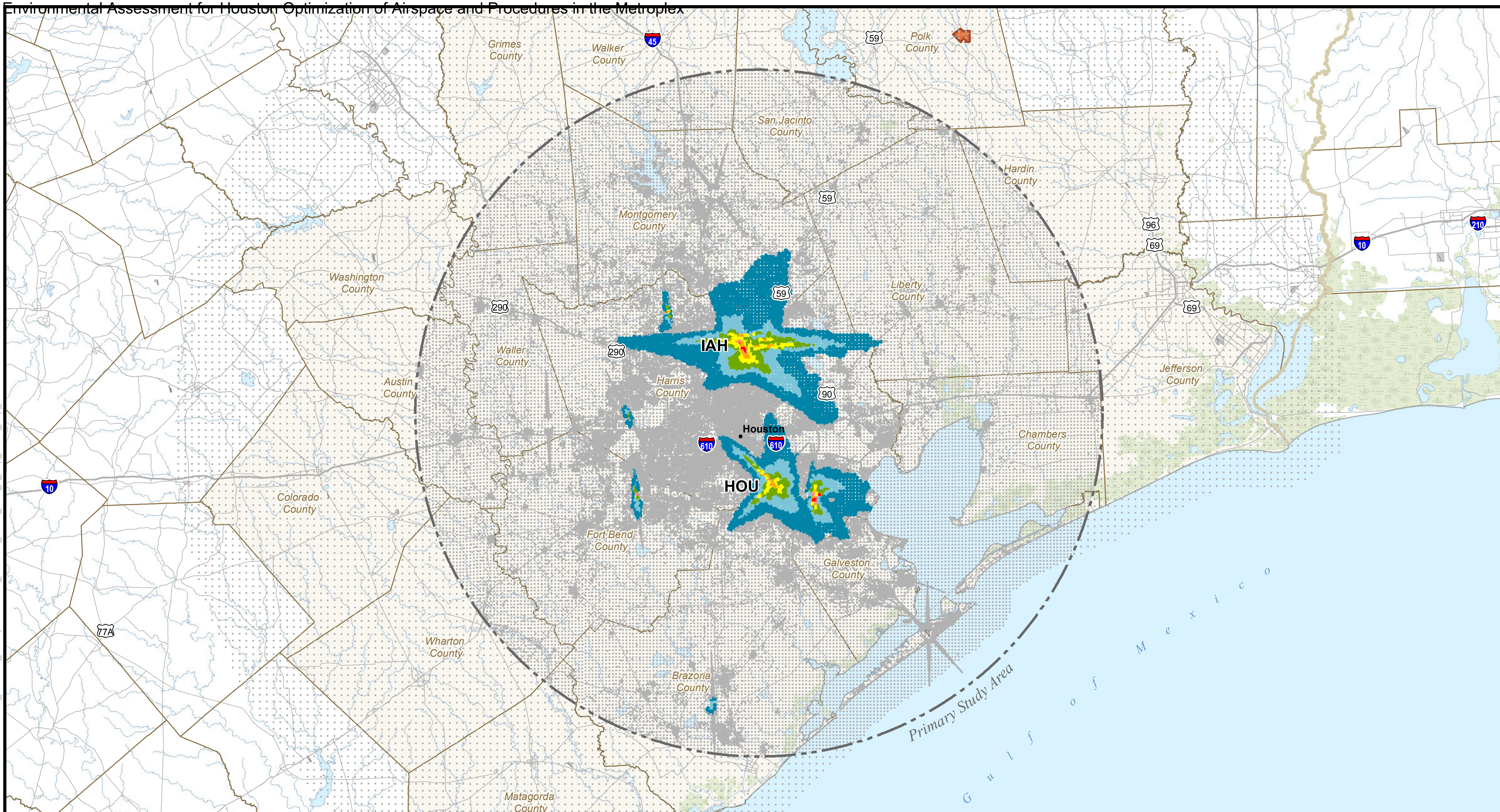

Path: H:\GIS\USA\TX\305220_Houston_Metroplex\305220_Houston_Metro_NTR_8_Pop_Noise_Exp_2019NA.mxd

Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated); National Atlas (Tribal Land/Wilderness Areas), February 08, 2012;

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North

0 10 20 Nautical Miles

Primary Study Area
Airport Boundary
State Boundary
County/Parish Boundary

35 Interstate Highway
Highways
Secondary Roads
Water
River/Stream
Alabama-Coushatta Tribe of Texas Reservation

2019 No Action DNL Levels
DNL < 45.0 dB
DNL 45.0 - 50.0 dB
DNL 50.0 - 55.0 dB
DNL 55.0 - 60.0 dB
DNL 60.0 - 65.0 dB
DNL 65.0 - 70.0 dB
DNL 70.0 - 75.0 dB
DNL > 75.0 dB

All Modeled Points Exposed to Aircraft Noise
No Action, 2019

Figure 8

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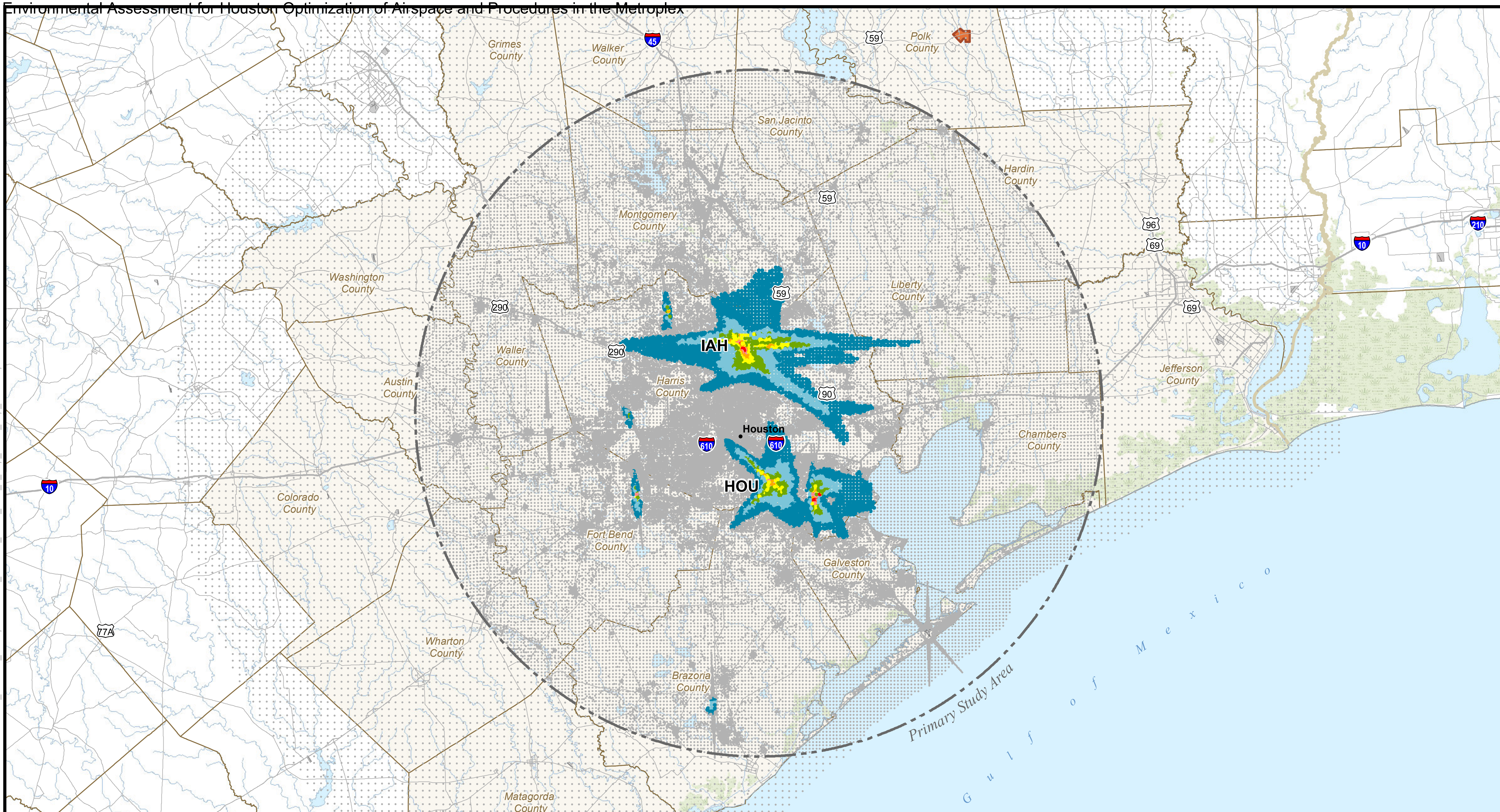

Path: H:\GIS\USA\TX\305220_Houston_Metroplex\305220_Houston_Metro_NTR_9_Pop_Noise_Exp_2014PropAction.mxd

Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated); National Atlas (Tribal Land/Wilderness Areas), February 08, 2012;

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North

0 10 20 Nautical Miles

Primary Study Area
Airport Boundary
State Boundary
County/Parish Boundary

Interstate Highway
Highways
Secondary Roads
Water
River/Stream
Alabama-Coushatta Tribe of Texas Reservation

2014 Proposed Action DNL Levels
- DNL < 45.0 dB
- DNL 45.0 - 50.0 dB
- DNL 50.0 - 55.0 dB
- DNL 55.0 - 60.0 dB
- DNL 60.0 - 65.0 dB
- DNL 65.0 - 70.0 dB
- DNL 70.0 - 75.0 dB
- DNL > 75.0 dB

All Modeled Points Exposed to Aircraft Noise
Proposed Action, 2014

Figure 9

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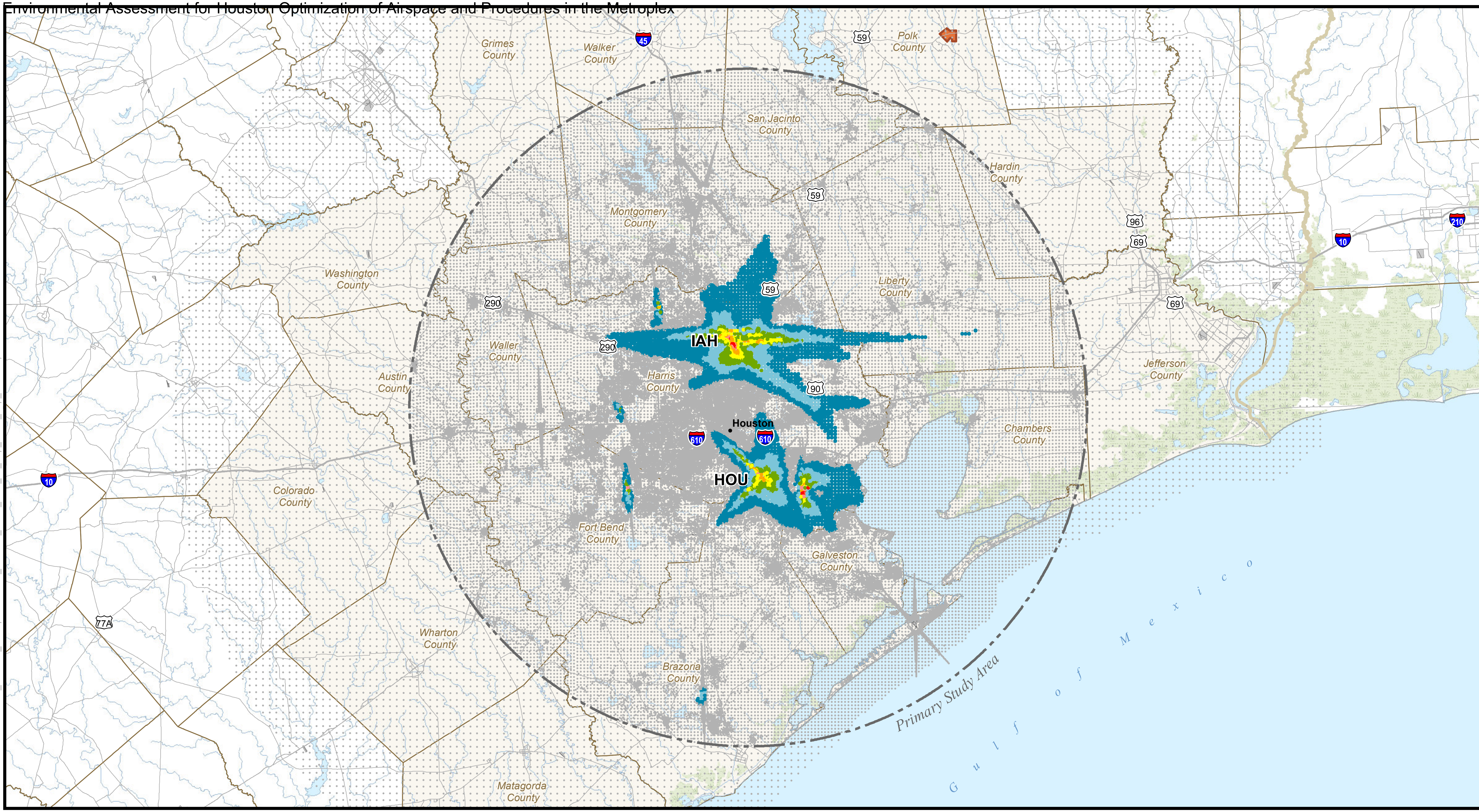

Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated); National Atlas (Tribal Land/Wilderness Areas), February 08, 2012;

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North

0 10 20 Nautical Miles

- Primary Study Area
- Airport Boundary
- State Boundary
- County/Parish Boundary
- Interstate Highway
- Highways
- Secondary Roads
- Water
- River/Stream
- Alabama-Coushatta Tribe of Texas Reservation

2019 Proposed Action DNL Levels

- DNL < 45.0 dB
- DNL 45.0 - 50.0 dB
- DNL 50.0 - 55.0 dB
- DNL 55.0 - 60.0 dB
- DNL 60.0 - 65.0 dB
- DNL 65.0 - 70.0 dB
- DNL 70.0 - 75.0 dB
- DNL > 75.0 dB

All Modeled Points Exposed to Aircraft Noise
Proposed Action, 2019

Figure 10

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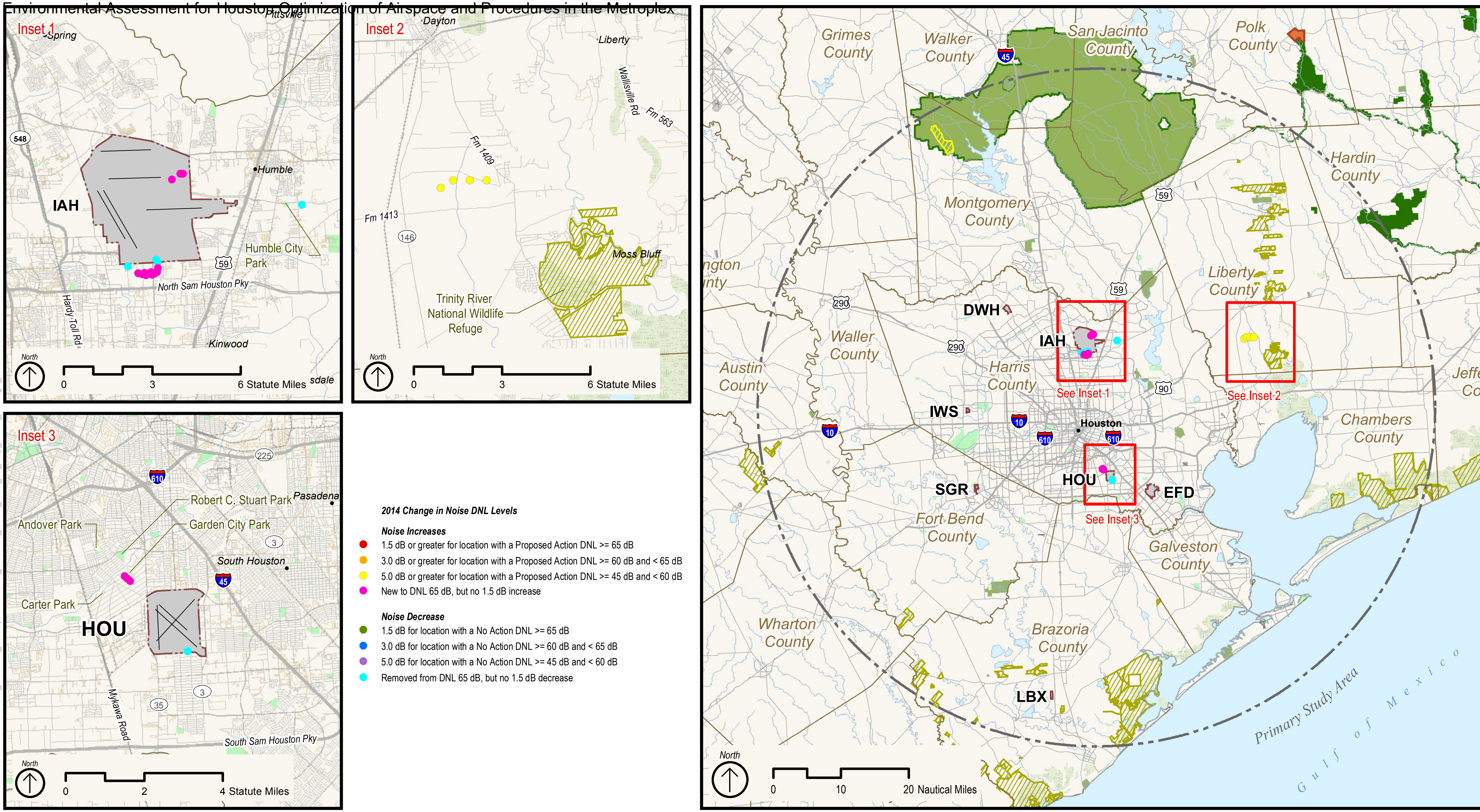

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Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; National Atlas (Tribal Land/Wilderness Areas), February 08, 2012; Texas Natural Resource Information System (TNRIS) (Wildlife Management Areas), February 08, 2012; US Fish & Wildlife Service (National Wildlife Refuge), June 13, 2012; United States Dept of Agriculture (National Forest), May 07, 2012; National Park Service (National Park), February 07, 2012; TNRIS (State Parks or Forest/Local Parks), May 03, 2012; ESRI (Local Parks), May 03, 2012; TNRIS (Department of Defense), February 08, 2012; TNRIS (Railroad), January 2, 2013;

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Primary Study Area
Study Airports
Other Airports
County/Parish Boundary
Alabama-Coushatta Tribe of Texas Reservation
Interstate Highway
Highways
Secondary Roads
Railroad
National Forest
National Park
State Park or Forest
Local Park or Recreation Area
National Wilderness Area
National Wildlife Refuge
State Wildlife Management Area
Water
River/Stream

Change of All Modeled Grid Points Exposed to Aircraft Noise, 2014

Figure 11

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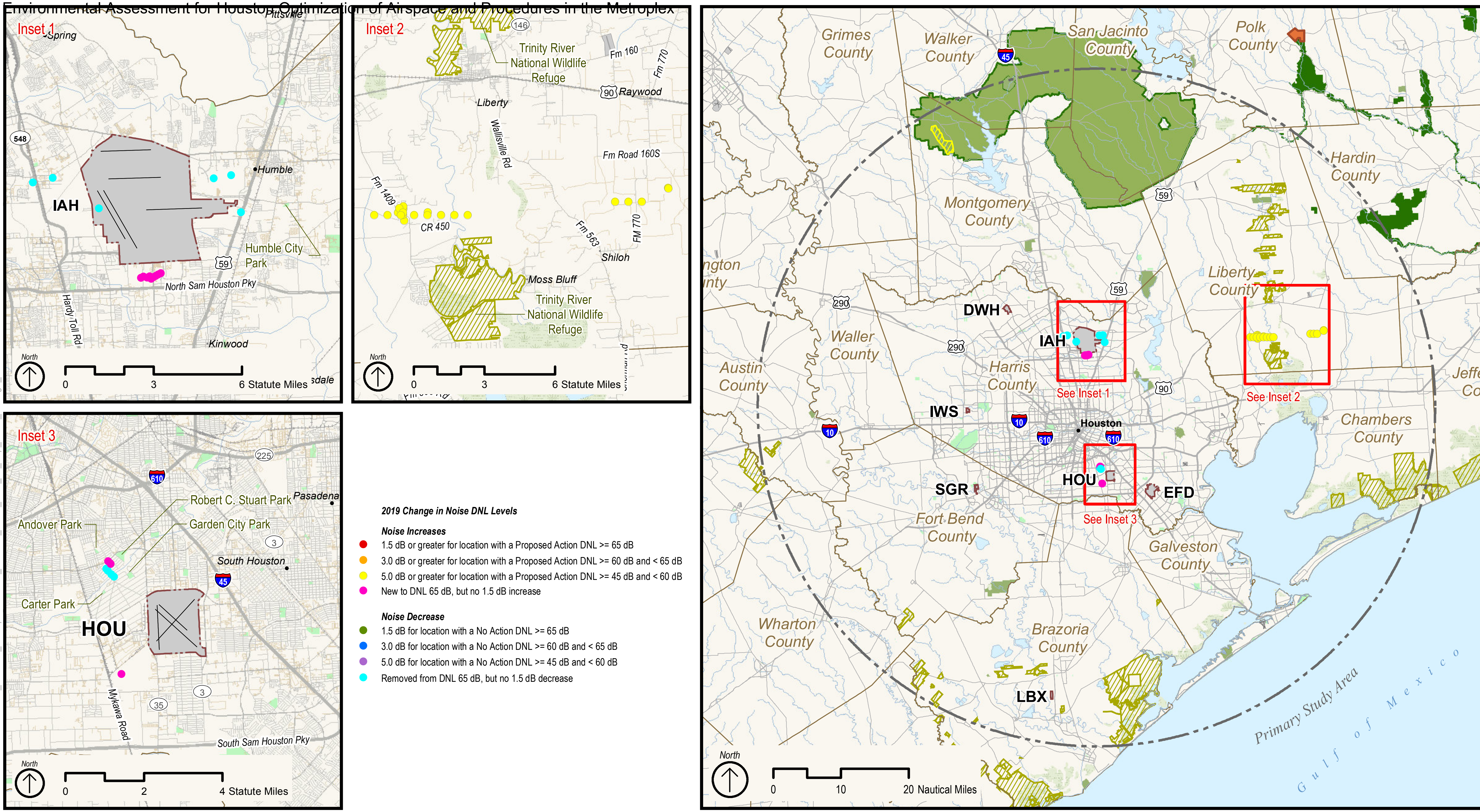

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Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; National Atlas (Tribal Land/Wilderness Areas), February 08, 2012; Texas Natural Resource Information System (TNRIS) (Wildlife Management Areas), February 08, 2012; US Fish & Wildlife Service (National Wildlife Refuge), June 13, 2012; United States Dept of Agriculture (National Forest), May 07, 2012; National Park Service (National Park), February 07, 2012; TNRIS (State Parks or Forest/Local Parks), May 03, 2012; ESRI (Local Parks), May 03, 2012; TNRIS (Department of Defense), February 08, 2012; TNRIS (Railroad), January 2, 2013;

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Primary Study Area
Study Airports
Other Airports
County/Parish Boundary
Alabama-Coushatta Tribe of Texas Reservation
Interstate Highway
Highways
Secondary Roads
Railroad
National Forest
National Park
State Park or Forest
Local Park or Recreation Area
National Wilderness Area
National Wildlife Refuge
State Wildlife Management Area
Water
River/Stream

Change of All Modeled Grid Points Exposed to Aircraft Noise, 2019

Figure 12

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Appendix A Memoranda

HARRIS MILLER MILLER & HANSON INC.
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July 31, 2012

Mr. Roger McGrath
Environmental and Airspace Specialist
Federal Aviation Administration
Central Service Area
Operations Support Group AJV-C2
2601 Meacham Blvd
Ft Worth, TX 76137-4298
roger.mcgrath@faa.gov

Subject: NIRS Non-Standard Aircraft Substitution Request
Reference: **Houston OAPM Environmental Assessment**
Contract No. DTFAWA-I I-D-00019, Order No. 0013
Subcontract No. 10-1110-HM, Work Order No. 0013
HMMH Project No. 305220.001

Dear Mr. McGrath

As part of the various Optimization of Airspace and Procedures in the Metroplex (OAPM) Environmental Assessments (EA), Harris Miller Miller & Hanson Inc. (HMMH) and ATAC Corp. are developing the inputs for the Noise Integrated Routing System (NIRS). The NIRS will be used to model the noise effects resulting from proposed changes to the airspace. Consistent with Federal Aviation Administration (FAA) policies and procedures, we submit this request for approval of the Houston OAPM EA identified aircraft types of interest (Attachment A).

While NIRS 7.0b.2 is consistent with the Integrated Noise Model (INM), version 7.0b, and therefore contains all of its supporting noise data, certain aircraft types that occur in the Metroplex existing and forecast fleets are not included in the NIRS database. In addition, there are no arrival procedure step profiles included with some aircraft types, meaning that NIRS will be unable to adequately reflect the noise from existing step-down procedures and thus permit comparisons to the proposed new OPDs. In these cases we have attempted to identify surrogate arrival aircraft types that would be compatible with NIRS. We request that the FAA review and approve these NIRS 7.0b2 substitutes for each of these aircraft models or provide a suitable substitution.

In accordance with FAA policy, we expect that this request will be reviewed by the FAA's Airspace Regulations & ATC Procedures Group Mission Support Services Group (AJV-114) and Office of Environment and Energy Noise Division (AEE-100). We will be happy to respond to questions regarding this request from yourself or those offices.

Sincerely yours,

HARRIS MILLER MILLER & HANSON INC.

David A. Crandall

c: G. Hines, FAA; S. Smith, ATAC Corp.
Attachment A: NIRS Aircraft Substitution Requests and Suggestions

ATTACHMENT A

NIRS AIRCRAFT SUBSTITUTION REQUESTS AND SUGGESTIONS

We have identified the following aircraft types included in the Houston OAPM EA for which an FAA approved substitution is required. In each case, we have identified a recommended substitute from the NIRS 7.0b2 database. The bases for the recommendations are discussed following the table.

This discussion refers, in some cases, to recent guidance FAA provided HMMH for the Seattle Greener Skies Environmental Assessment (SEA) with NIRS 7.0b2, HMMH Project No. 304050, on May 22, 2012. In addition, the Integrated Noise Model (INM) Version 7.0c is referenced as a source for determining substitute aircraft for some aircraft types.

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Houston OAPM Environmental Assessment
Request for NIRS 7.0b2 Aircraft Type Substitutions
July 31, 2012

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Table 1 Aircraft Types and Recommended NIRS Substitutions

#	Group	Aircraft Code	Represented Aircraft Models	Recommended NIRS Substitution	
				Departure	Arrival
1.1	Commercial Jet	A318	Airbus A318-111	A319-131	A319-131
1.2	Commercial Jet	B738	Boeing 737-800	737800	737700
1.3	Commercial Jet	B739	Boeing 737-900	737800	737700
1.4	Commercial Jet	B753	Boeing 757-300	757300	757RR
1.5	Commercial Jet	B764	Boeing 767-400	767400	A330-301
1.6	Commercial Jet	B772	Boeing 777-200	777200	A310-304
1.7	Commercial Jet	B773, B77W, B77L	Boeing 777-300	777300	A310-304
1.8	Commercial Jet	B787	Boeing 787	A330-343	A330-343
1.9	Commercial Jet	MD11	McDonnell Douglas MD11GE	MD11GE	727D17
			McDonnell Douglas MD11PW	MD11PW	
1.10	Commercial Jet	MD81	McDonnell Douglas MD81	MD81	MD9025
	Commercial Jet	MD82	McDonnell Douglas MD82	MD82	MD9025
	Commercial Jet	MD83	McDonnell Douglas MD83	MD83	MD9025
		MD88	McDonnell Douglas MD88	MD83	MD9025
	Commercial Jet	MD87	McDonnell Douglas MD87	MD81	MD9025
1.11	Jet	C680	680 Citation Sovereign	LEAR35	LEAR35
1.12	Jet	CL30	BD-100 Challenger 300	CL601	CL601
1.13	Jet	GALX	1126 Galaxy, Gulfstream 200	CL600	CL600
1.14	Jet	GLEX	BD-700 Global Express 5000	GV	GV
	Jet	GL5T			
1.15	Jet	EMB14L	Embraer EMB-145 LR	EMB14L	EMB145
1.16	Jet	E50P	Embraer EMB-500 Phenom 100	CNA510	CNA510
1.17	Jet	E55P	Embraer EMB-505 Phenom 300	CNA55B	CNA55B
1.18	Jet	FA20	Falcon 20 with ATF engines	CL600	CL600
1.19	Jet	FA7X	Dassault Falcon 7X	F10062	F10062
1.20	Jet	J328	Fairchild/Dornier 328 Regional Jet	CL600	CL600
1.21	Jet	PRM1	Premier 1, 390	LEAR35	LEAR35
1.22	Jet	Hawk, T45	BAE Systems T45 Goshawk	A7D	A7D
1.23	Jet	F-18, FA18	Boeing F-18 Hornet	LEAR25	A7D
1.24	Jet	WB57	Martin/General Dynamics WB57	KC135B	707QN
1.27	Jet	SBR2	Sabreliner 80	FAL20	FAL20
1.28	Jet	F-16	General Dynamics F-16 Falcon	LEAR25	LEAR25
1.27	Jet	U2	Lockheed U-2	DC93LW	A7D
1.28	Turbo Prop	P46T	Piper Malibu	CNA208	CNA208
1.29	Turbo Prop	SGUP	Aero Spaceline 377 Guppy	C130	C130
1.30	Piston Prop	PA31	Piper Cheyenne	BEC58P	BEC58P

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Houston OAPM Environmental Assessment
Request for NIRS 7.0b2 Aircraft Type Substitutions
July 31, 2012

Table 1 Aircraft Types and Recommended NIRS Substitutions

#	Group	Aircraft Code	Represented Aircraft Models	Recommended NIRS Substitution	
				Departure	Arrival
1.31	Piston Prop	P68	Partenavia P68 Observer	BEC58P	BEC58P
1.32	Piston Prop	P28A, PA28	Piper Cherokee, Warrior	GASEPF	GASEPF
1.33	Piston Prop	BE36	36 Bonanza	GASEPV	GASEPV
		CNA206,20T	Cessna 206/207 variants		
		CNA210	Cessna 210 variants		
		C185	Cessna 185		
1.34	Piston Prop	AC11	Rockwell Commander 114	GASEPV	GASEPV
		DA40	DA-40 Katana, Diamond Star		
		LEG2	Lancair Legacy 2000		
1.35	Kit	COL3, COL4	Lancair 400, Columbia 300/350/400	GASEPV	GASEPV
		SR22	Cirrus SR-22		
		SR20	Cirrus SR-20		
		EXP	Experimental		
		HXB	Home Built		

1.1 Airbus A318-111 – A318

We propose to model Airbus A318 operations with NIRS type A319-131.

The Airbus A318 is the smallest member of the Airbus narrow-body family that includes the A319, A320 and A321. This variant is not specifically available in NIRS 7.0b.2.

Table 2 presents the certification data for the version of the A318, that closest represents those operating at IAH. NIRS type A319-131 appears to be a good match and is approximately 1 dB louder at all measurement points compared to the A318.

Table 2 Noise Certification Data from Airbus A318 and Airbus A319

Manufacturer	Type Designation	MTOW (lb)	MLW (lb)	Engine Manufacturer / Type Designator	Noise Level (EPN dB)		
					Takeoff	Sideline	Approach
AIRBUS	A318-111	149,910	126,700	CFM56-5B8/P	84.10	90.40	93.90
AIRBUS	A319-131	158,730	149,910	V2522-A5	85.30	91.40	94.50

Source: FAA AC 36-1H, Change 1, Appendix 1 (April 24, 2012) at
http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/
Note:
The certification data for the Airbus A319-131 with V2522-A5 engines indicate weights that do not match NIRS/INM exactly. However the maximum takeoff weight in INM does correspond to another A319 variant.

1.2 Boeing 737-800 - B738

We propose to model the Boeing 737-800 arrival procedures in NIRS 7.0b2 using the 737700 procedures as approved for the Environmental Assessment (EA) "Greener Skies Over Seattle" (SEA).

Within NIRS 7.0b.2, the Boeing 737-800 has departure procedure step definitions; however there are no arrival procedure steps included, meaning that NIRS will be unable to adequately reflect the noise from existing step-down procedures and thus permit comparisons to the proposed new OPDs. Therefore, the 737700 arrival procedures are proposed for use for the 737800 as approved for the SEA EA.

1.3 Boeing 737-900 - B739

We propose to model the Boeing 737-900 with NIRS type 737800 using the 737700 arrival procedures as detailed in Section 1.2.

The 737-900 is listed in INM 7.0c as 737900 with the standard substitution of 737800. We propose to use the 737800 to represent 737-900 departures in NIRS. Within NIRS 7.0b.2, the Boeing 737-800 has departure procedure step definitions; however there are no arrival procedure steps included, meaning that NIRS will be unable to adequately reflect the noise from existing step-down procedures and thus permit comparisons to the proposed new Optimized Profile Descents (OPDs). Therefore, we propose to use 737700 to represent 737-900 arrivals.

1.4 Boeing 757-300 - B753

We propose to model the Boeing 757-300 arrival procedures in NIRS 7.0b2 using the 757RR procedures as approved for the Environmental Assessment (EA) "Greener Skies Over Seattle" (SEA).

Within NIRS 7.0b.2, the Boeing 757-300 has departure procedure step definitions; however there are no arrival procedure steps included, meaning that NIRS will be unable to adequately reflect the noise from existing step-down procedures and thus permit comparisons to the proposed new OPDs. Therefore, the 757RR arrival procedures are proposed for use for the 757300 as approved for the SEA EA.

1.5 Boeing 767-400 - B764

We propose to model the Boeing 767-400 arrival procedures in NIRS 7.0b2 using the A330-301 procedures.

Within NIRS 7.0b.2, the Boeing 767-400 has departure procedure step definitions; however there are no arrival procedure steps included, meaning that NIRS will be unable to adequately reflect the noise from existing step-down procedures and thus permit comparisons to the proposed new OPDs. Table 3 shows a comparison of the Boeing 767-400 with the Airbus A330-301. Both have General Electric CF6-80 variant engines. The certificated noise levels for approach are nearly identical. Therefore, the A330-301 arrival procedures are proposed for use for the 767400.

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July 31, 2012

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Table 3 Noise Certification Data from Boeing 767-400 and Airbus A330-301

Manufacturer	Type Designation	MLW (lb)	Engine Manufacturer / Type Designator	Noise Level (EPN dB) Approach
BOEING	767-400ER	349,265	CF6-80C2B8F	98.7
AIRBUS	A330-301	361,560	CF6-80E1A2	98.5
Source: FAA AC 36-1H, Change 1, Appendix 1 (April 24, 2012) at http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/				

1.6 Boeing 777-200 - B772

We propose to model the Boeing 777-200 arrival procedures in NIRS 7.0b2 using the A310-304 procedures as approved for the Environmental Assessment (EA) "Greener Skies Over Seattle" (SEA).

Within NIRS 7.0b.2, the Boeing 777-200 has departure procedure step definitions; however there are no arrival procedure steps included, meaning that NIRS will be unable to adequately reflect the noise from existing step-down procedures and thus permit comparisons to the proposed new OPDs. Therefore, the A310-304 arrival procedures are proposed for use for the 777200 as approved for the SEA EA.

1.7 Boeing 777-300/-300ER/-200LR - B773, B77W, B77L

We propose to model the Boeing 777-300 arrival procedures in NIRS 7.0b2 using the A310-304 procedures as approved for the Environmental Assessment (EA) "Greener Skies Over Seattle" (SEA).

We propose to model the Boeing 777-300ER, Boeing 777-200LR and the Boeing 777 Freighter in NIRS 7.0b2 using 777300 for departures and A310-304 for arrivals.

Within NIRS 7.0b.2, the Boeing 777-300 has departure procedure step definitions; however there are no arrival procedure steps included, meaning that NIRS will be unable to adequately reflect the noise from existing step-down procedures and thus permit comparisons to the proposed new OPDs. Therefore, the A310-304 arrival procedures are proposed for use for the 777300 as approved for the SEA EA.

The Boeing 777 family includes several variants. NIRS and INM include two aircraft, types 777200 and 777300, with maximum takeoff weights of 656,000 lb. and 660,000 lb. respectively. The INM lists the maximum static engine thrust of these aircraft as 90,000 lb. and 77,000 lb. respectively.

Boeing has added three additional variants to the 777 family: the 777-200LR, 777-Frieghter and the 777-300ER. The 777-Frieghter is a dedicated cargo variant of the 777-200LR. All three of these variants have maximum takeoff weights between 766,000 lb. and 775,000 lb. and engine options ranging from 110,100 lb. to 115,300 lb. thrust. ICAO Document 8643, "Aircraft Type Designators" differentiates these variants separately from the 777-200 (designator B772) and 777-300 (B773),

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using designators B77L for the 777-200LR and 777-Frieghter and B77W for the 777-300ER.[1] Table 4 presents a comparison of the Boeing 777 variants compiled from the Boeing Company's website referenced above.

The noise certification data for the 777 variants that are included in INM and that represent the B77L and B77W variants are included in Table 5. The maximum takeoff weights for the B77L and B77W variants are 14 to 17 percent greater than what is offered in NIRS and INM. The noise certification data for NIRS/INM type 777300, presented in Table 5 as B-777-300, is closer to B77L and B77W variants, especially for the approach and the full-power sideline certification points. The B77L and B77W variants have takeoff certification levels, which may include a thrust cut-back, in between those associated with INM type 777200 and 777300.[2] INM type 77300 appears to be the better match.

[1] ICAO Document 8643 corresponds to FAA Order 7340.2C Change 1 (effective 5/31/2012), Chapter 5. Although FAA Order 7340.2C does not list the B77L or B77W, these aircraft type designators have been used in flight plan data within the United States.
http://www.icao.int/publications/DOC8643/Pages/default.aspx
http://www.faa.gov/air_traffic/publications/atpubs/CNT/index.htm

[2] Thrust requirements for the take-off/flyover measurement and the sideline/lateral measurement are described in ICAO Annex 16 Vol. , Chapter 3 and 14 CFR Part 36.

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Houston OAPM Environmental Assessment
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July 31, 2012

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Table 4 Comparison of 777 Variants

Description	777-200	777-200ER	777-300	777-200LR	777-Freighter (777-F)	777-300ER
Passengers (Cargo)*	305 pax	301 pax	368 pax	301 pax	(112 tons)	365 pax
Engines; Max Thrust	Pratt & Whitney 4077 77,000 lb Rolls-Royce Trent 887 76,000 lb General Electric GE90-77B 77,000 lb	Pratt & Whitney 4090 90,000 lb Rolls-Royce Trent 895 93,400 lb General Electric GE90-94B 93,700 lb	Pratt & Whitney 4098 98,000 lb Rolls-Royce Trent 892 90,000 lb General Electric 90-94B 93,700 lb	General Electric GE90-110B1 110,100 lb General Electric GE90-115BL 115,300 lb	General Electric GE90-110B1L 110,100 lb General Electric GE90-115BL 115,300 lb	General Electric GE90-115B 115,300 lb
Max Range	5,240 nm	7,725 nm	6,005 nm	9,395 nm	4,900 nm**	7,930 nm
Wing Span	199 ft 11in	199 ft 11in	199 ft 11 in	212 ft 7in	212 ft 7 in	212 ft 7 in
Overall Length	209 ft 1in	209 ft 1in	242 ft 4 in	209 ft 1 in	209 ft 1 in	242 ft 4 in

Sources:
http://www.boeing.com/commercial/777family/pf/pf_200product.html
http://www.boeing.com/commercial/777family/pf/pf_300product.html
http://www.boeing.com/commercial/777family/pf/pf_lrproduct.html
http://www.boeing.com/commercial/777family/pf/pf_freighter_product.html
As viewed July 11, 2012
*Does not include cargo for passenger variants.
**This appears to be the maximum range with maximum payload of 112 tons and therefore may not be directly comparable to the other entries.

Table 5 Noise Certification Data for Boeing 777 Variants

Manufacturer	Type Designation	MTOW (lb)	MLW (lb)	Engine Manufacturer / Type Designator	Effective Perceived Noise Level (EPNdB)		
					Takeoff	Sideline	Approach
Boeing	B-777-200	656,000	470,000	GE90-90B (BLK IV)	91.5	95.7	98.3
Boeing	B-777-300	660,000	524,000	Rolls Royce Trent 892	94.2	96.9	100.4
Boeing Company	777-F	766,000	575,000	GE90-110B1	92.6	97.9	100.3
Boeing Company	777-200LR	750,010	492,070	GE90-110B1	91.9	97.9	99.7
Boeing Company	777-200LR	757,070	492,070	GE90-110B1	92.2	97.9	99.7
Boeing Company	777-200LR	763,020	492,070	GE90-110B1	92.5	97.9	99.7
Boeing Company	777-300ER	750,010	554,000	GE90-115B	91.9	98.9	100.5
Boeing Company	777-300ER	759,600	554,000	GE90-115B	92.3	98.8	100.5
Boeing Company	777-300ER	774,930	554,000	GE90-115B	92.8	98.7	100.5

Sources:
Data for B-777-200 and B-777-300, corresponding to INM types 777200 and 777300, respectively, from FAA AC 36-1H, Change 1, Appendix 1 (April 24, 2012), at http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/
Data for 777-F, 777-200LR, and 777-300ER from TCDSN database for Jets Issue 13 as posted in "TCDSN Jets.xls" on http://easa.europa.eu/certification/type-certificates/noise.php February 7, 2012
777-F from TCDSN record A10078
777-200LR from TCDSN records A4924, A4925 and A4926
777-300ER from TCDSN records A5603, A10649 and A5609
Weights converted from EASA reported units of kg and rounded to tens of lb.
FAA AC-36-1H reported values of Takeoff and Sideline are the same as EASA/ICAO reported values of Flyover and Lateral, respectively.

1.8 Boeing 787

We propose to model the Boeing 787 operations with A330-343 procedures in NIRS 7.0b2

The Boeing 787 is a new twin-engine, wide-body aircraft. We propose to model 787 operations with the A330-343.

1.9 McDonnell Douglas MD-11 Series (MD11GE, MD11PW)

We propose to model the Boeing (McDonnell Douglas) MD-11 series arrival procedures in NIRS 7.0b2 using the 727D17 procedures as approved for the Environmental Assessment (EA) "Greener Skies Over Seattle" (SEA) for the MD11PW.

Within NIRS 7.0b.2, the Boeing McDonnell Douglas MD-11 series aircraft have departure procedure step definitions; however there are no arrival procedure steps included, meaning that NIRS will be unable to adequately reflect the noise from existing step-down procedures and thus permit comparisons to the proposed new OPDs.

The MD11GE has nearly the same certificated approach noise level (103.6 EPNdB) as the MD11PW (103.8 EPNdB) per FAA AC36-1H, Change 1, Appendix 1 (dated 4/24/2012). Therefore, it seems appropriate to use the same substitute, 727D17, as identified by the FAA for use in modeling the MD11PW arrivals, for also modeling the MD11GE arrivals.

1.10 McDonnell Douglas MD-80 Series (MD81, MD82, MD83, MD87, MD88)

We propose to model the Boeing (McDonnell Douglas) MD-80 series arrival procedures in NIRS 7.0b2 using the MD9025 procedures as approved for the Environmental Assessment (EA) "Greener Skies Over Seattle" (SEA) for the MD83.

The use of the MD9025 arrival procedure was recommended by the FAA for modeling the MD83 arrival in NIRS 7.0b2 for SEA. The other MD80 series aircraft (MD81, MD82) also do not have arrival procedure steps; therefore due to the similarity we also propose using the MD9025 arrival procedures for these aircraft types. MD87 and MD88 are substitutions mapped to MD81 and MD83, respectively.

1.11 Cessna Citation Sovereign - C680

We propose to model C680 operations with NIRS type LEAR35.

This aircraft was certified in 2004 with a maximum takeoff weight (MTOW) of 30,300 lb. and maximum landing weight (MLW) of 27,100 lb. and is powered by two Pratt & Whitney Canada PW306C turbofans rated at 5,770 lb. Table 6 provides certification values for these three aircraft and the LEAR35.

Table 6 Noise Certification Data from Cessna 680 and Learjet LEAR35

Manufacturer	Type Designation	MTOW (lb)	MLW (lb)	Engine Manufacturer / Type Designator	Noise Level (EPNdB)		
					Fly Over/ Takeoff	Lateral/ Sideline	Approach
Cessna	Cessna 680	30,298	27,099	PW 306C	71.8	87.5	91.3
Learjet	LEAR 35 A	18,000	14,300	TFE731-2-2B	78.70	87.40	91.30

All weights converted from certification data into pounds.
Source for Cessna 680: EASA Record No. A2489, file "TCDSN Jets (080711).xls", as posted on http://easa.europa.eu/ws_prod/c/c_tc_noise.php on April 30, 2009
Source for LEAR35: FAA AC 36-1H, Change 1, Appendix 1 (April 24, 2012) at http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/

1.12 BD-100 Challenger 300 - CL30

We propose to model CL30 operations with NIRS type CL601.

The BD-100 Challenger CL30 is listed in INM 7.0c as BD100 with the standard substitution of the CL601.

1.13 1126 Galaxy Gulfstream 200 - GALX

We propose to model GALX operations with NIRS type CL600.

The G200 Gulfstream 200 is listed in INM 7.0c as G200 with the standard substitution of the CL600.

1.14 Bombardier BD-700 Global Express/Global 5000 – GLEX and GL5T

We propose to model GLEX and GL5T operations with NIRS type GV.

The Bombardier BD-700 Global Express is listed in INM 7.0c as BD700 with the standard substitution of the Gulfstream V (GV).

1.15 Embraer EMB-145 LR (EMB14L)

We propose to model Embraer 145 LR (NIRS type EMB14L) arrival procedures in NIRS 7.0b2 using the EMB145.

Within NIRS 7.0b.2, type EMB14L has departure procedure step definitions; however the standard arrival procedure steps profiles are defined such that NIRS cannot modify the altitude profile of the EMB14L until above 6,000 ft above the airfield (as opposed to the typical 3,000 ft), meaning that NIRS will be unable to adequately model aircraft in level flight in certain areas.

Table 7 Modeled Sound Exposure Levels in INM7.0b for EMB14L and EMB145

Aircraft Type	Distance to Landing Threshold (feet)					
	5,000	**10,000**	**15,000**	**20,000**	**25,000**	**50,000**
EMB14L	89.8	86.2	83.7	81.6	80.1	72.3
EMB145	89.9	86.1	83.7	81.1	78.0	69.5

1.16 Embraer EMB-500 Phenom 100 – E50P

We propose to model EMB-500 Phenom 100 operations with NIRS type CNA510.

Table 8 presents certification data for the EMB-500 and similar types that are available in INM/NIRS. The Cessna Mustang, identified in INM 7.0b as CNA510, has the same series of engines as the EMB-500 and provides the closest match in certification levels.

Table 8 Noise Certification Data for Embraer EMB 500 Phenom 100, Cessna Citation Mustang, Eclipse 500 and Cessna Bravo

Manufacturer	Type Designation	MTOW (lb)	MLW (lb)	Engine Manufacturer / Type Designator	Noise Level (EPN dB)		
					Fly Over/ Takeoff	Lateral/ Sideline	Approach
Embraer	EMB 500	10,472	9,766	PW617F-E	70.4	81.4	86.1
Cessna Aircraft Company	Cessna 510 / Citation Mustang	8,644	8,001	PW615F-A	73.9	85.0	86.0
Eclipse Aerospace, Inc.	EA500	6,001	5,600	PW610F-A	69.2	78.9	81.9
Cessna Aircraft Company	Model 550 / Bravo	14,800	13,499	PW530A	73.7	85.2	91.2
Notes: Source for Cessna 510: EASA Record No. A5809, file "MAdB Jets (120207).xls", as posted on http://easa.europa.eu/certification/type-certificates/noise.php on 7/2/2012. All weights converted from certification data from kilograms to pounds. Source for other aircraft FAA AC 36-1H, Change 1, Appendix 1 (April 24, 2012) at http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/							

1.17 Embraer EMB-505 Phenom 300 – E55P

We propose to model EMB-505 Phenom 300 operations with NIRS type CNA55B.

As shown in Table 9 the EMB-505 compares favorably with the Cessna 550 Bravo in certificated noise levels. They both have Pratt & Whitney 530-series engines.

Table 9 Noise Certification Data for Embraer EMB 505 Phenom 300 and Cessna Bravo

Manufacturer	Type Designation	MTOW (lb)	MLW (lb)	Engine Manufacturer / Type Designator	Noise Level (EPN dB)		
					Fly Over	Lateral	Approach
Embraer	EMB 505	17,930	16,830	PW535E	69.9	88.8	88.5
Cessna Aircraft Company	Model 550 / Bravo	14,800	13,499	PW530A	73.7	85.2	91.2
Notes: Source: EASA Record Nos. A14221 and A5651, file "MAdB Jets (120207).xls", as posted on http://easa.europa.eu/certification/type-certificates/noise.php on 7/2/2012. All weights converted from certification data from kilograms to pounds							

1.18 Falcon 20 with ATF engines - FA20

We propose to model the FA20 with Honeywell ATF engines with NIRS type CL600

Various series of the Falcon 20 have different and relatively quieter engines than the CF700-2D on the FAL20 INM aircraft. The Falcon 200 has the ATF engines with the LEAR35 as the INM standard substitution aircraft in INM7.0b, but revised to the CL600 in INM7.0c. Table 10 compares various Falcon models with the CL600 and LEAR35.

Table 10 Noise Certification Data for Falcon Aircraft and Lear 35

Manufacturer	Type Designation	MTOW (lb)	MLW (lb)	Engine Manufacturer / Type Designator	Noise Level (EPN dB)		
					Takeoff	Sideline	Approach
Dassault	Falcon 20-G (M2500)	32,000	27,560	ATF3-6-2C	87.5	88.3	95.9
Dassault	Falcon 20 Basic	28,660	27,320	CF700-2D-2	90.0	92.3	101.7
Dassault	Falcon 200	32,000	27,600	ATF3-6A-4C	83.9	89.0	93.9
Bombardier	CL600	36,000	33,000	ALF-502	81.6	89.3	91.2
Lear	Lear 35/36	18,000	14,300	TFE731-2-2B	84.5	87.9	92.2
Source: FAA AC 36-1H, Change 1, Appendix 1 (April 24, 2012) at http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/							

1.19 Dassault Falcon 7X - FA7X

We propose to model FA7X operationswithNIRS type F10062.

The Dassault Falcon 7X is a relatively new three-engine (two are fuselage mounted, one tail mounted) corporate jet and does not have an FAA- approved INM substitution. The FA7X is powered by three Pratt & Whitney Canada PW 307A engines and is heavier than previous three-engine Dassault corporate aircraft that are powered by Allied Signal/Garrett TFE731 series engines (i.e. Falcon 50 and Falcon 900). The Dassault Falcon 7X has a certified maximum take-off weight (MTOW) of 31,298 kg (69,000 lb.) and a certified maximum landing weight (MLW) of 28,304 kg (62,400 lb.). For comparison, the Fokker 100 has a MTOW of 43,090 kg and a MLW of 38,780 kg. Table 11 presents a comparison of the Dassault Falcon 7X and Fokker 100 certification data.

Table 11 Noise Certification Data from Dassault Falcon 7X and Fokker 100

Manufacturer	Type Designation	MTOW (lb)	MLW (lb)	Engine Manufacturer / Type Designator	Noise Level (EPN dB)		
					Fly Over	Lateral	Approach
Dassault Aviation	Falcon 7X	69,000	62,400	PW 307 A	83.7	90.4	92.6
Fokker Services	F28 Mark 0100	95,000	85,321	Rolls-Royce Tay 620-15	83.4	89.3	93.1
Source: EASA Record Nos. A5655 and A3770, file "MAdB Jets (120207).xls", as posted on http://easa.europa.eu/certification/type-certificates/noise.php on 7/2/2012. All weights converted from certification data from kilograms to pounds on 7/2/2012							

1.20 Fairchild/Dornier 328 Regional Jet - J328

We propose to model J328 operations with NIRS type CL600.

The Fairchild/Dornier 328 Regional Jet is listed in INM 7.0c as D328J with the substitution aircraft type CL600.

1.21 Premier 1 390 - PRM1

We propose to model PRM1operations with NIRS type LEAR35.

The Premier 1 390 is listed in INM7.0c as R390 with the substitution aircraft LEAR35.

1.22 BAE Systems T45 Goshawk - T45, HAWK

We propose to model T45/HAWK operations with NIRS type A7D.

The NIRS program has a limited number of military fighter aircraft profiles and characteristics available for modeling - the single-engine A7D and the two-engine F-4C. The T45/HAWK is a single-engine military training aircraft that, for this noise study, operates primarily through Ellington Field (EDF). Since strictly military aircraft do not undergo certification testing, there are no certification data available to compare and derive a best substitute. The INM identifies the HAWK INM aircraft type but does not provide any procedure step profiles that NIRS requires. Therefore, the A7D is proposed as the substitute for the T45/HAWK aircraft.

1.23 Boeing F-18 Hornet - F18, FA18

We propose to model the F18 operations with NIRS type A7D for arrivals and LEAR25 for departures.

We compared SEL values from INM 7.0b for departures of the F18 and other various aircraft types to find a best match. The resulting proposed substitutes were the best approximations of the F18. There was not any best match for the arrivals and the number of military fighter aircraft in NIRS is limited to the A7D and F4C. The LEAR25 was selected for departures and A7D was selected for arrivals.

Table 12 Modeled Sound Exposure Levels in INM7.0b for F18

Aircraft Type	Distance from Brake Release for Takeoff (feet)					
	15,000	**20,000**	**25,000**	**30,000**	**35,000**	**60,000**
F18	104.5	100.2	97.6	95.6	93.6	86.5
LEAR25	105.3	100.1	97.3	95.4	93.4	85.2
A7D	111.3	106.6	102.9	99.9	97.0	85.5
Distance to Landing Threshold (feet)						
	5,000	**10,000**	**15,000**	**20,000**	**25,000**	**50,000**
F18	114.9	105.9	101.0	90.0	87.6	96.0
A7D	104.9	100.5	97.6	94.4	90.3	82.1

1.24 General Dynamics WB57 Canberra - WB57

We propose to model WB57 operations with NIRS type KC135B for departures and 707QN for arrivals.

These aircraft are operated by NASA at Ellington Field. As in the case for the F18, we compared SEL values from INM 7.0b for departures and arrivals of the B57 and other various aircraft types to find a best match. Table 13 shows the results for the two aircraft substitutions proposed.

Table 13 Modeled Sound Exposure Levels in INM7.0b for WB57

Aircraft Type	Distance from Brake Release for Takeoff (feet)					
	15,000	**20,000**	**25,000**	**30,000**	**35,000**	**60,000**
B57E	114.4	109.0	105.5	103.0	100.8	93.7
KC135B	112.8	107.5	104.3	102.2	100.5	91.7
Distance to Landing Threshold (feet)						
	5,000	**10,000**	**15,000**	**20,000**	**25,000**	**50,000**
B57E	101.8	97.6	94.8	92.7	91.0	85.1
707QN	103.3	98.7	95.6	92.9	90.9	84.0

1.25 Sabreliner 80 - SBR2

We propose to model SBR2 operations with NIRS type FAL20.

The standard NIRS/INM aircraft SABR80 has only fixed-point profiles for arrival and departure and not the procedure step profiles desired for analysis in NIRS. A comparison of SEL contours in INM 7.0b for the SABR80 and FAL20 (both Stage 2certified aircraft) in Figure 1 shows good agreement and the foundation for using the FAL20 as the appropriate substitute in NIRS for this project.

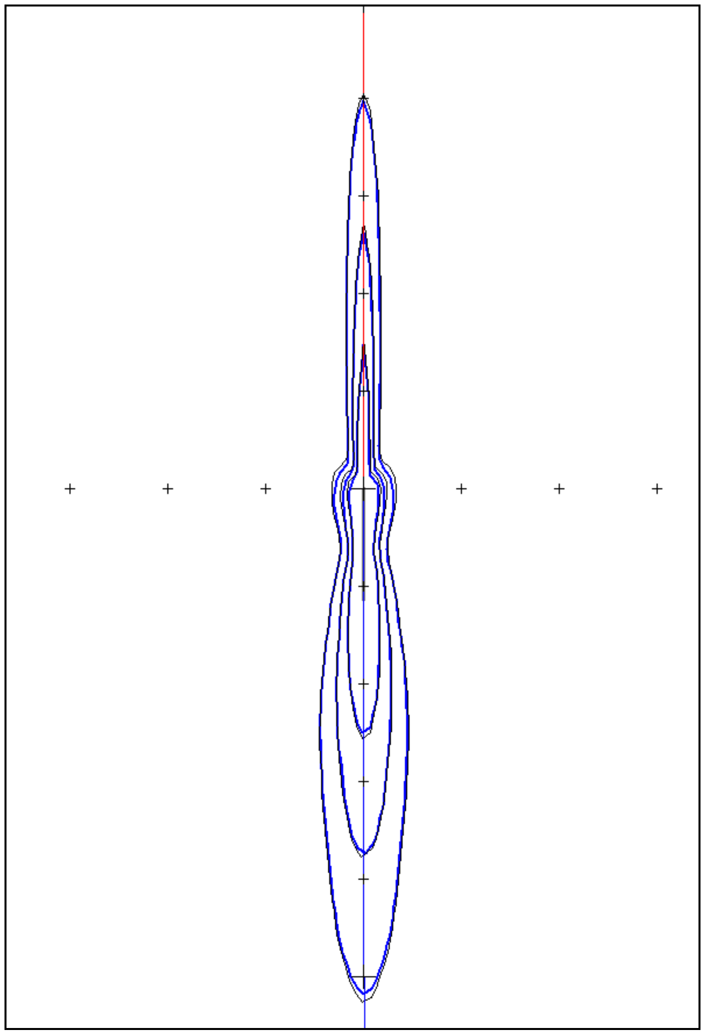

Figure 1 85, 90 and 95 SEL Contours for SABR80 (Blue) Compared FAL20 (Black) (1 nautical mile grid spacing)

1.26 General Dynamics F-16 Falcon - F16

We propose to model F16 operations with NIRS type LEAR25.

We compared SEL values from INM 7.0b for departures and arrivals of the F16 and other various aircraft types to find a best match. None of the F16 variants have procedure step profiles for input to NIRS. Table 14 shows the SELs for comparing the F16GE, A7D, and LEAR25 aircraft. The LEAR25 is the NIRS 7.0b.2 approved substitute for the T38 and is proposed for the F16.

Table 14 Modeled Sound Exposure Levels in INM7.0b for F16

Aircraft Type	Distance from Brake Release for Takeoff (feet)					
	15,000	**20,000**	**25,000**	**30,000**	**35,000**	**60,000**
F16GE	100.2	95.8	92.4	89.9	87.7	80.4
A7D	111.3	106.6	102.9	99.9	97.0	85.5
LEAR25	105.3	100.1	97.3	95.4	93.4	85.2
Distance to Landing Threshold (feet)						
	5,000	**10,000**	**15,000**	**20,000**	**25,000**	**50,000**
F16GE	93.2	85.0	81.1	79.8	79.5	79.2
A7D	104.9	100.5	97.6	94.4	90.3	82.1
LEAR25	100.3	96.5	93.9	91.2	88.1	77.1

1.27 Lockheed U-2 - U2

We propose to model U2 operations with NIRS type A7D for arrivals and DC93LW for departures.

These aircraft are operated by NASA at Ellington Field. We compared SEL values from INM 7.0b for departures and arrivals of the U2 and other various aircraft types to find a best match. Table 15 shows the results for the two aircraft substitutions proposed.

Table 15 Modeled Sound Exposure Levels in INM7.0b for U2

Aircraft Type	Distance from Brake Release for Takeoff (feet)					
	15,000	**20,000**	**25,000**	**30,000**	**35,000**	**60,000**
U2	94.1	87.3	81.6	77.3	74.0	68.5
DC93LW	94.4	91.9	89.3	87.3	86.0	79.2
Distance to Landing Threshold (feet)						
	5,000	**10,000**	**15,000**	**20,000**	**25,000**	**50,000**
U2	107.7	103.5	100.8	98.7	96.8	87.3
A7D	104.9	100.5	97.6	94.4	90.3	82.1

1.28 Piper Malibu - P46T

We propose to model P46T operations with NIRS type CNA208.

The CNA208 single-engine turboprop seems to be the best fit for the P46T. Both have PT6A series engines with comparable maximum takeoff weights as shown in Table 16.

Table 16 Noise Certification Data from Cessna 208 and Piper PA46

Manufacturer	Type Designation	MTOW (lb)	MLW (lb)	Engine Manufacturer / Type Designator	Noise Level (dB)
					Takeoff
Cessna	208	8,000	8,000	Pratt & Whitney PT6A-114A	79.0
Piper	PA46-500TP	4,850	4,850	Pratt & Whitney PT6A-42A	73.7

Source: FAA AC36-1H, Change 1, Appendix 8 (April 24, 2012) at http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/aircraft_noise_levels/

1.29 Aero Spaceline 377 Guppy - SGUP

We propose to model SGUP operations with NIRS type C130.

These aircraft are operated by NASA at Ellington Field. The SGUP is a four-engine turboprop; therefore, it appears to be best aligned with the NIRS/INM type C130.

1.30 Piper Cheyenne - PA31

We propose to model PA31 operations with NIRS type BEC58P.

Within NIRS 7.0b.2, the PA31 does not have the required procedure step profiles to adequately address the noise on departure or arrival. Therefore, the BEC58P procedures are proposed for use for the PA31, a twin-engine piston aircraft.

1.31 Partenavia P68 Observer - P68

We propose to model P68 operations with NIRS/INM type BEC58P.

This twin-engine piston aircraft is similar in size and engine type to the INM Beech Baron (BEC58P).

1.32 Piper Warrior - P28

We propose to model the P28 procedures in NIRS 7.0b2 using the GASEPF procedures as the PA28 does not have procedure step profiles required for NIRS.

Within NIRS 7.0b.2, the PA28 does not have the required procedure step profiles to adequately address the noise on departure or arrival. Therefore, the GASEPF procedures are proposed for use for the P28 as identified for other Piper 28 models in NIRS 7.0b2 User's Guide, Appendix E.

1.33 Beechcraft Bonanza 36 - BE36
Cessna 206/207 - CNA206, CNA20T
Cessna 210 variants
Cessna 185 - C185

We propose to model these aircraft with NIRS type GASEPV since the CNA206 NIRS type does not have arrival and departure procedure step profiles.

These aircraft would normally be mapped to the CNA206 or CNA20T. However, without the procedure step profiles (as previously discussed), the GASEPV is proposed as the NIRS/INM aircraft type to substitute for these aircraft. This is consistent to historical INM substitutions in INM 6.0a when these aircraft or variants were mapped to the GASEPV type aircraft.

1.34 Rockwell Commander 114 - AC11
Diamond Star - DA40
Lancair Legacy 2000 - LEG2

We propose to model these aircraft operations with NIRS type GASEPV.

These aircraft are all small single-engine aircraft with either a two or three-blade, constant-speed, variable pitch propeller that would probably be best modeled as GASEPV.

1.35 Kit Aircraft (Lancair Columbia 300/400 – COL3/COL4, , Cirrus SR-22 and SR-20 - SR22, SR20, various experimental and home-built aircraft)

We propose to model the following these kit aircraft operations with NIRSM type GASEPV as approved for some of these aircraft in previous INM studies.

These aircraft types have a variety of different engine options and, as such, are difficult to characterize without having detailed specifications of the actual aircraft. Therefore, a conservative grouping of these types with the GASEPV NIRS/INM aircraft type is made.

U.S. Department of Transportation
Federal Aviation Administration

Office of Environment and Energy

800 Independence Ave., S.W.
Washington, D.C. 20591

Date: August 10, 2012

Mr. Roger McGrath
Environmental and Airspace Specialist
Central Service Area
Federal Aviation Administration

Dear Mr. Roger McGrath

The Office of Environment and Energy (AEE) has received your email dated August 01, 2011, requesting approval of modeling 35 aircraft/groups using surrogate aircraft in the Noise Integrated Routing System (NIRS). This request is to evaluate noise in support of an Environmental Assessment (EA) of the Houston Optimization of Airspace and Procedures in the Metroplex (OAPM) program.

Harris Miller Miller & Hanson Inc. (HMMH) is assisting FAA in conducting the EA (reference HMMH project 305220.001) and is using NIRS version 70b2 in the analysis.

While NIRS 70b2 is consistent with the Integrated Noise Model (INM), version 7.0b, and therefore contains all of its supporting noise data, certain aircraft types that occur in the Metroplex existing and forecast fleets are not included in the NIRS database. In addition, certain aircraft in the NIRS data have fixed point arrival profiles only, and do not have the arrival procedural profiles which are needed in better modeling various operational procedures. Therefore, HMMH identified 35 aircraft/groups (see attachment in this letter) and proposed substitution aircraft accordingly.

AEE concurs with all but one of the proposed aircraft substitutions. Instead of modeling the arrival operation of the Boeing 767-400 with the A330-301, AEE recommends that the A330-343 be used. AEE concurs with all other proposed aircraft substitutions.

Please understand that this approval is limited to this project for Houston OAPM. Any additional projects or non-standard aircraft substitution will require separate approval.

Sincerely,

Rebecca Cointin, Acting Manager
AEE/Noise Division

cc: Donna Warren, AJV-11

Attachment – Aircraft types and proposed NIRS substitutions for Hou OAPM EA (reference HMMH project 305220.001).

#	Group	Aircraft Code	Represented Aircraft Models	Recommended NIRS Substitution	
				Departure	Arrival
1.1	Commercial Jet	A318	Airbus A318-111	A319-131	A319-131
1.2	Commercial Jet	B738	Boeing 737-800	737800	737700
1.3	Commercial Jet	B739	Boeing 737-900	737800	737700
1.4	Commercial Jet	B753	Boeing 757-300	757300	757RR
1.5	Commercial Jet	B764	Boeing 767-400	767400	~~A330-301~~ A330-343 (AEE recommendation)
1.6	Commercial Jet	B772	Boeing 777-200	777200	A310-304
1.7	Commercial Jet	B773, B77W, B77L	Boeing 777-300	777300	A310-304
1.8	Commercial Jet	B787	Boeing 787	A330-343	A330-343
1.9	Commercial Jet	MD11	McDonnell Douglas MD11GE	MD11GE	727D17
			McDonnell Douglas MD11PW	MD11PW	
1.10	Commercial Jet	MD81	McDonnell Douglas MD81	MD81	MD9025
	Commercial Jet	MD82	McDonnell Douglas MD82	MD82	MD9025
	Commercial Jet	MD83	McDonnell Douglas MD83	MD83	MD9025
		MD88	McDonnell Douglas MD88	MD83	MD9025
	Commercial Jet	MD87	McDonnell Douglas MD87	MD81	MD9025
1.11	Jet	C680	680 Citation Sovereign	LEAR35	LEAR35
1.12	Jet	CL30	BD-100 Challenger 300	CL601	CL601
1.13	Jet	GALX	1126 Galaxy, Gulfstream 200	CL600	CL600
1.14	Jet	GLEX	BD-700 Global Express 5000	GV	GV
	Jet	GL5T			
1.15	Jet	EMB14L	Embraer EMB-145 LR	EMB14L	EMB145
1.16	Jet	E50P	Embraer EMB-500 Phenom 100	CNA510	CNA510
1.17	Jet	E55P	Embraer EMB-505 Phenom 300	CNA55B	CNA55B
1.18	Jet	FA20	Falcon 20 with ATF engines	CL600	CL600
1.19	Jet	FA7X	Dassault Falcon 7X	F10062	F10062
1.20	Jet	J328	Fairchild/Dornier 328 Regional Jet	CL600	CL600
1.21	Jet	PRM1	Premier 1, 390	LEAR35	LEAR35
1.22	Jet	Hawk, T45	BAE Systems T45 Goshawk	A7D	A7D
1.23	Jet	F-18, FA18	Boeing F-18 Hornet	LEAR25	A7D
1.24	Jet	WB57	Martin/General Dynamics WB57	KC135B	707QN
1.27	Jet	SBR2	Sabreliner 80	FAL20	FAL20
1.28	Jet	F-16	General Dynamics F-16 Falcon	LEAR25	LEAR25
1.27	Jet	U2	Lockheed U-2	DC93LW	A7D
1.28	Turbo Prop	P46T	Piper Malibu	CNA208	CNA208
1.29	Turbo Prop	SGUP	Aero Spaceline 377 Guppy	C130	C130
1.30	Piston Prop	PA31	Piper Cheyenne	BEC58P	BEC58P
1.31	Piston Prop	P68	Partenavia P68 Observer	BEC58P	BEC58P
1.32	Piston Prop	P28A, PA28	Piper Cherokee, Warrior	GASEPF	GASEPF
1.33	Piston Prop	BE36	36 Bonanza	GASEPV	GASEPV
		CNA206,20T	Cessna 206/207 variants		
		CNA210	Cessna 210 variants		
		C185	Cessna 185		
1.34	Piston Prop	AC11	Rockwell Commander 114	GASEPV	GASEPV
		DA40	DA-40 Katana, Diamond Star		
		LEG2	Lancair Legacy 2000		
1.35	Kit	COL3, COL4	Lancair 400, Columbia 300/350/400	GASEPV	GASEPV
		SR22	Cirrus SR-22		
		SR20	Cirrus SR-20		
		EXP	Experimental		
		HXB	Home Built		

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MEMORANDUM

To:	Roger McGrath Environmental & Airspace Specialist FAA, ATO Central Service Center Operations Support Group AJV-C2
From:	David Crandall Contractor Technical Lead (Houston OAPM)
Date:	July 31, 2012
Subject:	Recommended Satellite Airports for Noise Analysis - DRAFT
Reference:	**Houston OAPM Environmental Assessment** Contract No. DTFAWA-I I-D-00019, Order No. 0013 Subcontract No. 10-1110-HM, Work Order No. 0013 HMMH Job No.305220.001

The purpose of this memorandum is to obtain your concurrence with our recommendation for the list of satellite airports to include as part of the detailed noise analysis for the Houston Optimization of Airspace and Procedures in the Metroplex (OAPM) Environmental Assessment (EA). The Houston OAPM EA noise analysis will include George Bush Intercontinental Airport (IAH) and William P. Hobby Airport (HOU).

We recommend that the following satellite airports are considered for the noise analysis based on analysis presented in this memorandum:

- Ellington Field (EFD)
- David Wayne Hooks (DWH)
- West Houston (IWS)
- Texas Gulf Coast Regional (LBX)
- Sugarland Regional (SGR)

Note that some of these airports maybe dismissed later if we find that there are insufficient operations that will be affected by the proposed action.

1. BACKGROUND

To date, several potential satellite airports have been identified for inclusion in the project. Candidacy for any given airport was provided by one or more of the following sources:

- Design & Implementation (D&I) Team, in particular the “Optimization of Airspace and Procedures in the Metroplex (OAPM) Design Submission Executive Summary Houston Metroplex” (undated)
- FAA Southwest Airports District Office (Southwest ADO)
- Our review of the existing published procedures and the airports associated with those procedures that the D&I team is proposing to modify/replace

In total, the following 15 satellite airports could have published procedure changes associated with the project and have been identified for possible inclusion in the Houston OAPM EA noise analysis:

Houston Southwest (AXH)
Lone Star Executive (CXO)[1]
David Wayne Hooks (DWH)
Ellington Field (EFD)
Weiser Air Park (EYQ)
Scholes International (GLS)
Baytown (HPY)
West Houston (IWS)
Texas Gulf Coast Regional (LBX)
Pearland Regional (LVJ)
Sugar Land Regional (SGR)
Houston Executive (TME)
Chambers County (T00)
La Porte Municipal (T41)
RWJ Airpark (54T)

Easterwood Field Airport (CLL) and Beaumont-Port Arthur (BPT)[2] were initially considered, but dropped from the list of potential satellite airports based on discussions with the D&I Team and review of the aforementioned D&I Team executive summary.

Through discussions within our team (including FAA staff), it was determined that there are three possible options for including these satellite airports in the noise analysis:

(1) Include all satellite airports

(2) Exclude all satellite airports

(3) Determine measurable or qualifying criteria for including satellite airports

Note that the D&I team is not proposing the modification or replacement of any instrument procedures that serve these airports directly to or from the runway (i.e. no instrument approach procedures and no RNAV departure procedures with off-the-ground runway transitions).

2. EXISTING FAA GUIDANCE

FAA provides the following guidance[3] regarding projects that do not require noise analysis.

14.6 PROJECTS NOT REQUIRING A NOISE ANALYSIS.

14.6a. No noise analysis is needed for proposals involving Design Group I and II airplanes (wingspan less than 79 feet) in Approach Categories A through D (landing speed less than 166 knots) operating at airports whose forecast operations in the period covered by the EA do not exceed 90,000 annual propeller operations (247 average daily operations) or 700 jet operations (2 average daily operations). These numbers of general aviation (GA) propeller and jet operations result in DNL 60 dB contours of less than 1.1 square miles that extend no more than 12,500 feet from start of takeoff roll. The DNL 65 dB contour areas would be 0.5 (one-half) square mile or less and extend no more than 10,000 feet from start of takeoff roll. Note that the Cessna Citation 500 and any other jet aircraft producing levels less than the propeller aircraft under study may be counted as propeller aircraft rather than jet aircraft.

The typical application of this paragraph is generally interpreted as the 90,000 annual propeller operations or 700 jet operations. However, the last sentence indicates that some jets may be counted as propeller aircraft based on noise levels. In our interpretation, the primary two thresholds in

[1] Lone Star Executive – this airport is currently preparing an EA for a runway extension.
[2] These airports are outside the Primary Study area.
[3] FAA Order 1050.1E, Appendix A, Section 14.6 "Projects Not Requiring a Noise Analysis".

determining whether noise analysis is required are: (1) DNL 60 dB contour area is less than 1.1 square miles; and (2) DNL 65 dB contour is less than 0.5 square miles. The FAA's Area Equivalent Method (AEM) [4] 7.0 tool was used to estimate the area of noise contours and the results were compared to these two criteria and are provided in the table below for years 2014 (first full year of implementation) and 2019 (five years after implementation).

Section 3 discusses the aircraft operations and assumptions developed for input into the AEM. Section 4 compares the AEM results to the FAA guidance provided above as thresholds in determining whether noise analysis is required.

3. OPERATONS DEVELOPMENT

The AEM requires aircraft operation data, specifically number of operations and aircraft type, as input. Only certain Instrument Flight Rules (IFR) operations are affected by the proposed action. Calendar year 2011 IFR flight plan data were acquired for each of the candidate satellite airports from the Mitre Corporation. The flight plan data were used to identify the IFR aircraft fleet mix, time of day operations and, through balancing the number of arrivals and departures to the same level, the IFR itinerant operations.

Operations development for a particular airport followed one of the two methodologies described below. Section 4, and the associated tables, identifies which airport used which methodology and includes a summary of the operations.

3.1 Airports with Air Traffic Control Towers

For airports with air traffic control towers, the Air Traffic Data Systems (ATADS)[5] provided the overall number of itinerant Instrument Flight Rules (IFR)/Visual Flight Rules (VFR) aircraft operations and itinerant VFR local operations for calendar year 2011. The fleet mix for the VFR itinerant operations was assumed to be split between the most common twin-engine aircraft in the IFR flight plan data and the general aviation single-engine propeller variable pitch (GASEPV) AEM aircraft weighted 1/3 twin-engine and 2/3 single-engine. The local operations were assumed to be flown by the GASEPV[6].

The calendar year 2011 operations were scaled to the FAA Terminal Area Forecast (TAF) for years 2014 and 2019. The only adjustment made to the fleet mix (the ratio of individual aircraft types relative to the total fleet) was that aircraft certified to 14 CFR Part 36 Stage 2 were replaced in the 2019 forecast with similar 14 CFR Part 36 Stage 3 aircraft.[7]

3.2 Airports without Air Traffic Control Towers

For airports without air traffic control towers and/or FAA TAF data, the most recent FAA 5010 National Facility Data Center (NFDC) files were used to obtain FAA operations levels for itinerant

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[4] The AEM, and associated documentation, is available to the public at http://www.faa.gov/about/office_org/headquarters_offices/apl/research/models/aem_model/

[5] http://aspm.faa.gov/opsnet/sys/Main.asp?force=atads, [extracted May 18, 2012]

[6] GASPV is a relatively loud single engine piston aircraft and provides a conservative estimate of aircraft noise for this purpose.

[7] 14 CFR Part 36 describes noise certification of aircraft. Stage 2 aircraft are louder than Stage 3 aircraft of the same weight. 14 CFR Part 36 Stage 2 aircraft will typically not be allowed to operate in the continental United States after December 31, 2015 per the *FAA Modernization and Reform Act of 2012*

and local operations. The IFR itinerant operations and fleet mix were obtained as previously discussed. The "balanced" IFR operations were scaled by a factor of 1.4 to reflect a similar relationship, between flight plan data and ATADS IFR counts, as those cases where ATADS data were available. The number of VFR itinerant operations was then determined to be the difference in total and IFR itinerant operations.

For years 2014 and 2019 when no TAF data were available, a scaling factor determined for a similar airport in size and operations was applied to derive forecast year itinerant and local operations. The only adjustment made to the fleet mix was that aircraft certified to 14 CFR Part 36 Stage 2 were replaced in the 2019 forecast with similar 14 CFR Part 36 Stage 3 aircraft.

4. NOISE CONTOUR AREA ESTIMATE COMPARED TO CRITERIA

The AEM provided the resulting areas in square miles within the DNL 60 dB and 65 dB contours. The AEM presents results to the nearest 0.1 square miles while the 1050.1E, Appendix A, Section 14.6 criteria for the DNL 65 dB contour is 0.5 square miles. Therefore the finest resolution reported by the AEM is 20% of the DNL 65 dB criteria. To conservatively account for this, the application of the 1050.1E, Appendix A, Section 14.6 criteria was modified by subtracting 0.1 square miles. Therefore if the area within the DNL 60 dB contour reported by AEM was less than 1.0 square miles or the area within the DNL 65 dB contour was less than 0.4 square miles, that particular airport is not recommended for further noise analysis. The results of the AEM screening are provided in the following tables. The AEM spreadsheets for each of the airports are provided in the attachment to this memo.

Table 1 provides the results of the AEM analysis for airports with Air Traffic Control Towers. The results indicate that DWH and SGR exceed the AEM screening while CXO and GLS do not.

Table 2 provides the results of the AEM analysis for airports without Air Traffic Control Towers. The results indicate that IWS, LBX, LVJ and T41 exceed the AEM screening while AXH, EYQ, HPY, T00, TME and 54T do not. Section 5 provides additional discussion related to LBX, LVJ and T41.

Table 1 AEM Screening for Airports with Air Traffic Control Towers

Airport	Aircraft Operations*		Year	Area in Square Miles within DNL Contours	
	IFR	VFR		DNL 65 dB	DNL 60 dB
Lone Star Executive (CXO)	10,541	46,815	2014	0.3	0.8
	10,560	48,424	2019	0.3	0.7
David Wayne Hooks (DWH)	22,837	160,269	2014	0.8	2.1
	23,808	164,270	2019	0.7	1.8
Scholes International (GLS)	3,805	25,250	2014	0.3	0.7
	3,967	26,085	2019	0.2	0.4
Sugar Land Regional (SGR)	25,887	43,683	2014	0.4	1.1
	27,305	45,000	2019	0.4	1.0

Notes: (1) The highlighted cells represent those that come within 0.1 square miles of exceeding the 1050.1E thresholds in Section 14.6. (2) Ellington Field was not screened and will be included in the list of airports recommended for further noise analysis.
*Forecasted operations using the methodology discussed in Section 3.1

Table 2 AEM Screening for Airports without Air Traffic Control Towers

Airport	Aircraft Operations*		Year	Area in Square Miles within DNL Contours	
	IFR	VFR		DNL 65 dB	DNL 60 dB
Houston Southwest (AXH)	2,497	48,753	2014	0.2	0.5
	2,816	55,265	2019	0.2	0.6
Weiser Air Park (EYQ)	1,129	39,835	2014	0.2	0.6
	1,278	45,120	2019	0.2	0.6
Baytown (HPY)	1,835	8,514	2014	0.1	0.2
	2,079	9,642	2019	0.1	0.2
West Houston (IWS)	14,222	94,785	2014	0.4	1.0
	15,248	101,772	2019	0.4	1.1
Texas Gulf Coast Regional (LBX)	5,373	79,718	2014	0.5	1.6
	5,976	88,972	2019	0.5	1.8
Pearland Regional (LVJ)	1,957	92,167	2014	0.3	1.0
	2,146	101,191	2019	0.4	1.0
Chambers County (T00)	251	2,983	2014	0.0	0.1
	284	3,379	2019	0.0	0.1
La Porte Municipal (T41)	1,639	85,471	2014	0.4	1.2
	1,839	95,918	2019	0.5	1.3
Houston Executive (TME)	3,072	6,630	2014	0.1	0.2
	3,236	7,753	2019	0.1	0.2
RWJ Airpark (54T)	549	9,477	2014	0.1	0.1
	622	10,734	2019	0.1	0.2

Note: The highlighted cells represent those that come within 0.1 square miles of exceeding the 1050.1E thresholds in Section 14.6.
*Forecasted operations using the methodology discussed in Section 3.2

5. REVIEW OF FLIGHT PLAN DATA AND USE OF PROCEDURES

As an additional screening tool of the AEM results displayed in the previous table, a review was conducted of the IFR flight plan data to determine an estimate of the number of IFR flights for a satellite airport that used a Standard Terminal Arrival Route (STAR) or Standard Instrument Departure (SID). The flight plan data list the intended route of flight to include navigation points or intersections and any applicable SIDs or STARs. Of interest is the number of aircraft operations that could be affected by the Proposed Action.

LBX, LVJ, and T41 had few IFR operations, as shown in the previous table, and were thus selected for this additional screening. For CY2011, LBX flight plan data had over 1,200 jet operations that could be affected by the Proposed Action. In the same time period LVJ and T41 each had fewer than 60 aircraft operations that could be affected by the proposed action. This represents less than 1 operation per day.

Therefore, LVJ and T41 were removed from consideration for recommended inclusion in the noise analysis for the Houston OAPM EA.

6. GRAPHIC DEPICTION OF SATELLITE AIRPORTS CONSIDERED

The following figure shows the primary airports, IAH and HOU, and the 15 satellite airports reviewed for consideration and inclusion in the overall noise analysis. Those recommended for inclusion are identified as “Airports Recommend for Noise Modeling”.

It should be noted that LBX is near the southern boundary of the Primary Study area, and LBX was not one of the initial airports used to define the Primary Study area.[8] However our initial review indicates that LBX operations going through the southern Primary Study area boundary are propeller aircraft that should not be affected by the proposed action. We expect that the LBX operations affected by the Proposed Action are to/from the north of LBX.

[8] The Primary and Supplemental Area analysis used aircraft operations from the airports listed in the HAATS EA, 2005 (IAH, HOU, EFD, CXO, DWH and SGR).

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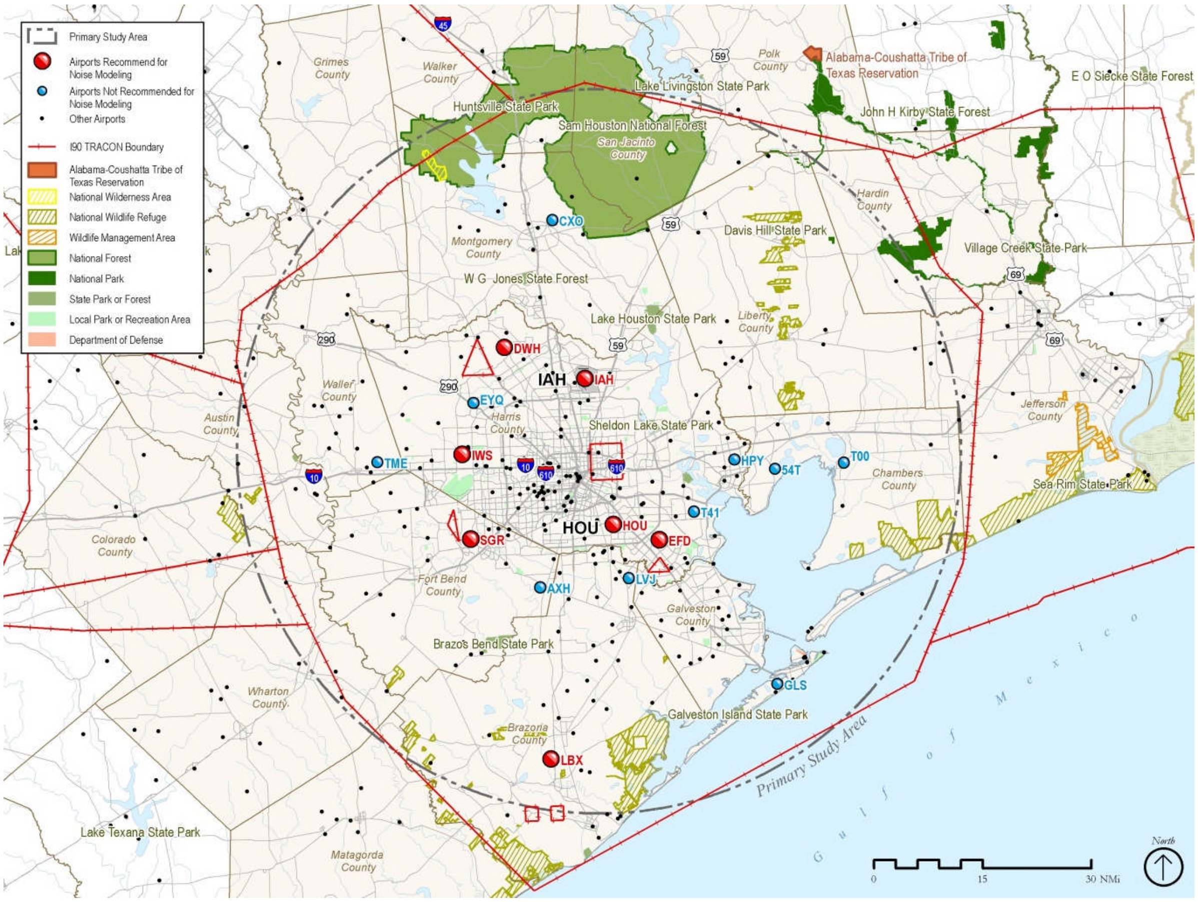

ATTACHMENT - AREA EQUIVALENT MODEL SPREADSHEETS

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	54T 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.1	
60		0.1	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.01	0.00
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.05
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.07	0.00
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.04	
CNA206			0.10	0.01
CNA20T				
CNA441			0.03	
CNA500				
CNA55B			0.00	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC850				
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			1.28	0.19
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20			0.00	
GASEPF			0.01	
GASEPV			11.27	0.64
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD82				
MD83				
MD9025				
MD9028				
MU3001				
PA28			0.01	
PA30				
PA31			0.00	
SABR80				
SD330				
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	54T 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.1	
60		0.2	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.01	0.00
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.06
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.08	0.00
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.05	
CNA206			0.12	0.01
CNA20T				
CNA441			0.03	
CNA500				
CNA55B			0.01	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			1.46	0.22
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.01	
GASEPV			12.77	0.73
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001				
PA28			0.01	
PA30				
PA31			0.01	
SABR80				
SD330				
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	AXH 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.2	
60		0.5	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.05	
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.10
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			7.47	0.08
C130				
C130E				
CIT3				
CL600			0.01	
CL601				
CNA172			0.20	0.02
CNA206			0.56	0.04
CNA20T				
CNA441			0.18	0.00
CNA500			0.06	0.00
CNA55B			0.03	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.13	0.00
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062			0.00	
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.09	0.00
GASEPV			59.11	1.83
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25			0.01	
LEAR35			0.06	0.00
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.03	0.00
PA28			0.10	0.01
PA30			0.00	
PA31			0.01	
SABR80				
SD330			0.03	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	AXH 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.2	
60		0.6	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.05	
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				0.11
737700				
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			8.35	0.08
C130				
C130E				
CIT3				
CL600			0.01	
CL601				
CNA172			0.22	0.02
CNA206			0.63	0.04
CNA20T				
CNA441			0.20	0.00
CNA500			0.07	0.01
CNA55B			0.03	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.14	0.00
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062			0.01	
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.10	0.01
GASEPV			67.11	2.08
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.08	0.01
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.03	0.00
PA28			0.11	0.01
PA30			0.01	
PA31			0.01	
SABR80				
SD330			0.04	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	CXO 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.3	
60		0.8	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.51	0.03
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.04
737800				
737D17				
737N17				
737N9				
737QN			0.01	
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			12.54	0.77
C130			0.00	
C130E				
CIT3			0.09	
CL600			0.12	
CL601			0.02	
CNA172			0.72	0.03
CNA206			1.38	0.04
CNA20T				
CNA441			0.36	0.01
CNA500			0.61	0.03
CNA55B			0.32	0.01
CNA750			0.13	0.01
COMJET				
COMSEP			0.00	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.00	
DC6			0.00	
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			1.20	0.23
DHC6QP				
DHC7				
DHC8			0.01	
DHC830				
EMB120				
EMB145			0.36	0.03
EMB14L				
F10062			0.07	0.01
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20			0.00	
GASEPF			0.55	0.03
GASEPV			53.43	1.88
GII			0.02	0.00
GIIB			0.02	0.00
GIV			0.12	0.01
GV			0.01	
HS748A				
IA1125			0.50	0.04
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25			0.18	0.01
LEAR35			0.97	0.05
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.33	0.01
PA28			0.21	0.00
PA30			0.10	
PA31			0.15	0.01
SABR80				
SD330			0.21	0.03
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	CXO 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.3	
60		0.7	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.51	0.03
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.04
737800				
737D17				
737N17				
737N9				
737QN			0.01	
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			12.56	0.77
C130			0.00	
C130E				
CIT3			0.09	
CL600			0.12	
CL601			0.02	
CNA172			0.72	0.03
CNA206			1.38	0.04
CNA20T				
CNA441			0.36	0.01
CNA500			0.61	0.03
CNA55B			0.32	0.01
CNA750			0.13	0.01
COMJET				
COMSEP			0.00	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.00	
DC6			0.00	
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			1.20	0.23
DHC6QP				
DHC7				
DHC8			0.01	
DHC830				
EMB120				
EMB145			0.36	0.03
EMB14L				
F10062			0.07	0.01
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.56	0.03
GASEPV			55.54	1.96
GII				
GIIB				
GIV			0.17	0.01
GV			0.01	
HS748A				
IA1125			0.50	0.04
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25			0.00	
LEAR35			1.16	0.06
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.33	0.01
PA28			0.21	0.00
PA30			0.10	
PA31			0.15	0.01
SABR80				
SD330			0.21	0.03
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	DWH 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.8	
60		2.1	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			1.46	0.14
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.09
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D			0.02	
BAC111				
BAE146				
BAE300				
BEC58P			37.68	2.36
C130				
C130E				
CIT3			0.28	0.01
CL600			0.40	0.01
CL601			0.09	0.01
CNA172			3.35	0.11
CNA206			3.08	0.09
CNA20T				
CNA441			1.02	0.03
CNA500			1.23	0.08
CNA55B			1.70	0.10
CNA750			0.28	0.01
COMJET				
COMSEP			0.02	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.03	
DC6			0.02	
DC820				
DC850				

Aircraft Type	BASE Case Daytime LTO Cycles	BASE Case Nighttime LTO Cycles	ALTERNATIVE Case Daytime LTO Cycles	ALTERNATIVE Case Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			2.37	0.15
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145			0.02	
EMB14L				
F10062			0.18	0.00
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20			0.24	0.01
GASEPF			0.85	0.02
GASEPV			180.54	7.13
GII			0.01	
GIIB			0.01	0.00
GIV			0.46	0.06
GV			0.01	0.00
HS748A			0.01	0.01
IA1125			0.18	0.03
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188			0.01	
LEAR25			0.34	0.06
LEAR35			1.54	0.11
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			1.72	0.09
PA28			0.19	0.00
PA30			0.03	0.00
PA31			0.21	0.00
SABR80				
SD330			0.48	0.04
SF340			0.03	

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	DWH 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.7	
60		1.8	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			1.53	0.15
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.09
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D			0.03	
BAC111				
BAE146				
BAE300				
BEC58P			39.28	2.46
C130				
C130E				
CIT3			0.29	0.01
CL600			0.42	0.01
CL601			0.10	0.01
CNA172			3.50	0.11
CNA206			3.21	0.10
CNA20T				
CNA441			1.06	0.03
CNA500			1.28	0.08
CNA55B			1.76	0.11
CNA750			0.29	0.01
COMJET				
COMSEP			0.02	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.04	
DC6			0.02	
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			2.47	0.16
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145			0.02	
EMB14L				
F10062			0.19	0.00
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.89	0.02
GASEPV			184.51	7.29
GII				
GIIB				
GIV			0.49	0.07
GV			0.01	0.00
HS748A			0.01	0.01
IA1125			0.19	0.03
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188			0.01	
LEAR25				
LEAR35			1.96	0.17
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			2.04	0.11
PA28			0.20	0.00
PA30			0.03	0.00
PA31			0.22	0.00
SABR80				
SD330			0.50	0.04
SF340			0.03	

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	EYQ 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.2	
60		0.6	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.00	
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.03
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.56	0.08
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.22	0.02
CNA206			0.16	0.01
CNA20T				
CNA441			0.03	
CNA500				
CNA55B				
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.01	
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.16	0.02
GASEPV			49.12	5.58
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001				
PA28			0.08	0.01
PA30			0.03	
PA31				
SABR80				
SD330				
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	EYQ 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.2	
60		0.6	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.01	
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.04
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.63	0.09
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.25	0.02
CNA206			0.18	0.01
CNA20T				
CNA441			0.03	
CNA500				
CNA55B				
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.01	
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.18	0.02
GASEPV			55.64	6.32
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001				
PA28			0.09	0.01
PA30			0.03	
PA31				
SABR80				
SD330				
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	GLS 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.3	
60		0.7	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.11	0.00
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700			0.00	0.07
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D			0.01	
BAC111				
BAE146				
BAE300				
BEC58P			0.37	0.01
C130				
C130E			0.00	
CIT3			0.07	0.04
CL600			0.06	0.01
CL601				
CNA172			0.32	0.01
CNA206			0.52	0.02
CNA20T				
CNA441			0.28	0.03
CNA500			0.32	0.01
CNA55B			0.18	0.01
CNA750			0.02	
COMJET				
COMSEP			0.02	
CONCRD				
CVR580			0.00	
DC1010				
DC1030				
DC1040				
DC3			0.01	0.00
DC6			0.00	
DC820				
DC850				

Aircraft Type	BASE Case Daytime LTO Cycles	BASE Case Nighttime LTO Cycles	ALTERNATIVE Case Daytime LTO Cycles	ALTERNATIVE Case Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			5.64	0.95
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145			0.01	0.00
EMB14L				
F10062			0.01	
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20			0.01	
GASEPF			0.11	0.02
GASEPV			20.24	0.76
GII				
GIIB			0.01	0.00
GIV			0.02	0.01
GV			0.02	
HS748A				
IA1125			0.06	0.03
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25			0.07	0.05
LEAR35			0.31	0.07
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

Aircraft Type	BASE Case Daytime LTO Cycles	BASE Case Nighttime LTO Cycles	ALTERNATIVE Case Daytime LTO Cycles	ALTERNATIVE Case Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.20	0.01
PA28			0.09	0.00
PA30			0.02	
PA31			0.03	0.00
SABR80				
SD330			0.04	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	GLS 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.2	
60		0.4	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.12	0.00
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700			0.00	0.07
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D			0.01	
BAC111				
BAE146				
BAE300				
BEC58P			0.39	0.01
C130			0.00	
C130E				
CIT3			0.07	0.04
CL600			0.06	0.01
CL601				
CNA172			0.34	0.01
CNA206			0.55	0.02
CNA20T				
CNA441			0.29	0.04
CNA500			0.33	0.01
CNA55B			0.18	0.01
CNA750			0.02	
COMJET				
COMSEP			0.02	
CONCRD				
CVR580			0.00	
DC1010				
DC1030				
DC1040				
DC3			0.01	0.00
DC6			0.00	
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			5.88	0.99
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145			0.01	0.00
EMB14L				
F10062			0.01	
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.12	0.02
GASEPV			20.78	0.78
GII				
GIIB				
GIV			0.03	0.01
GV			0.02	
HS748A				
IA1125			0.06	0.03
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.43	0.09
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.21	0.01
PA28			0.10	0.00
PA30			0.02	
PA31			0.03	0.00
SABR80				
SD330			0.04	
SF340			0.00	

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	HPY 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.1	
60		0.2	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.05	0.00
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.08
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			1.08	0.03
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.13	0.00
CNA206			0.39	0.05
CNA20T				
CNA441			0.08	0.00
CNA500			0.07	
CNA55B			0.05	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.06	
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.12	0.01
GASEPV			10.89	0.49
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.01	
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.38	0.00
PA28			0.05	0.02
PA30			0.03	
PA31				
SABR80				
SD330			0.09	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	HPY 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.1	
60		0.2	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.06	0.00
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.09
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			1.22	0.04
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.15	0.00
CNA206			0.44	0.06
CNA20T				
CNA441			0.09	0.01
CNA500			0.08	
CNA55B			0.05	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.07	0.01
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.14	0.01
GASEPV			12.34	0.55
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.01	
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.43	0.00
PA28				
PA30			0.06	0.02
PA31			0.04	
SABR80				
SD330			0.10	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	IWS 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.4	
60		1.0	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			1.68	0.07
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.03
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			12.16	0.64
C130				
C130E				
CIT3				
CL600			0.01	
CL601				
CNA172			0.54	0.01
CNA206			2.77	0.10
CNA20T				
CNA441			1.27	0.07
CNA500			0.72	0.09
CNA55B			0.51	0.01
CNA750				
COMJET				
COMSEP			0.00	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.01	
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			1.94	0.08
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062			0.00	
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.44	0.04
GASEPV			120.36	4.50
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25			0.00	
LEAR35			0.17	0.01
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.15	0.01
PA28			0.26	0.01
PA30			0.06	0.01
PA31			0.09	0.01
SABR80				
SD330			0.51	0.01
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	IWS 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.4	
60		1.1	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			1.80	0.08
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.03
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			12.94	0.68
C130				
C130E				
CIT3				
CL600			0.01	
CL601				
CNA172			0.58	0.01
CNA206			2.97	0.11
CNA20T				
CNA441			1.36	0.07
CNA500			0.77	0.09
CNA55B			0.54	0.01
CNA750				
COMJET				
COMSEP			0.00	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.01	
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			2.08	0.09
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062			0.00	
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.45	0.04
GASEPV			129.33	4.83
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.18	0.01
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.17	0.02
PA28			0.28	0.01
PA30			0.07	0.01
PA31			0.09	0.01
SABR80				
SD330			0.55	0.01
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	LBX 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.5	
60		1.6	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			22.86	0.30
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.10
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.31	0.01
C130				
C130E				
CIT3			0.07	0.02
CL600			0.07	
CL601				
CNA172			0.28	0.01
CNA206			39.20	7.08
CNA20T				
CNA441			0.16	0.01
CNA500			0.23	0.02
CNA55B			0.06	
CNA750			0.01	
COMJET				
COMSEP			0.00	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

Aircraft Type	BASE Case Daytime LTO Cycles	BASE Case Nighttime LTO Cycles	ALTERNATIVE Case Daytime LTO Cycles	ALTERNATIVE Case Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.16	0.01
DHC6QP				
DHC7			0.00	
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062			0.02	0.00
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20			0.08	0.03
GASEPF			0.10	0.02
GASEPV			35.88	6.51
GII			0.01	0.00
GIIB			0.00	
GIV			0.03	0.00
GV			2.24	0.01
HS748A				
IA1125			0.14	0.04
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.18	0.04
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.09	0.02
PA28			0.06	
PA30			0.03	0.01
PA31			0.05	0.00
SABR80				
SD330			0.01	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	LBX 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.5	
60		1.8	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			25.42	0.34
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.11
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.34	0.01
C130				
C130E				
CIT3			0.07	0.03
CL600			0.07	
CL601				
CNA172			0.31	0.01
CNA206			43.60	7.88
CNA20T				
CNA441			0.18	0.01
CNA500			0.26	0.02
CNA55B			0.07	
CNA750			0.01	
COMJET				
COMSEP			0.01	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.18	0.01
DHC6QP				
DHC7			0.01	
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062			0.02	0.00
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.11	0.02
GASEPV			40.26	7.30
GII				
GIIB				
GIV			0.05	0.01
GV			2.49	0.01
HS748A				
IA1125			0.16	0.04
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.20	0.05
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.19	0.05
PA28			0.07	
PA30			0.03	0.01
PA31			0.05	0.00
SABR80				
SD330			0.01	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	LVJ 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.3	
60		1.0	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D				
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.13
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			13.73	
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.20	0.01
CNA206			0.39	0.02
CNA20T				
CNA441			0.06	
CNA500			0.02	
CNA55B			0.00	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.00	
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.03	0.00
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.35	0.02
GASEPV			107.64	6.02
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.00	
PA28			0.26	0.03
PA30			0.00	
PA31			0.01	
SABR80				
SD330			0.01	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	LVJ 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.4	
60		1.0	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D				
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.14
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			15.06	
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.22	0.01
CNA206			0.43	0.02
CNA20T				
CNA441			0.07	
CNA500			0.02	
CNA55B			0.00	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.00	
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.03	0.00
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.39	0.02
GASEPV			118.19	6.61
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.00	
PA28			0.28	0.03
PA30			0.00	
PA31			0.01	
SABR80				
SD330			0.01	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	SGR 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.4	
60		1.1	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.54	0.04
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.05
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			13.22	0.38
C130			0.00	
C130E			0.01	
CIT3			1.81	0.32
CL600			1.79	0.14
CL601			0.44	0.01
CNA172			1.03	0.05
CNA206			1.72	0.04
CNA20T				
CNA441			1.74	0.06
CNA500			2.86	0.78
CNA55B			1.27	1.34
CNA750			1.11	0.03
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.01	
DC6			0.01	
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			1.54	0.81
DHC6QP				
DHC7			0.00	
DHC8			0.00	
DHC830				
EMB120			0.01	
EMB145			0.09	0.01
EMB14L				
F10062			0.43	0.05
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20			0.18	0.01
GASEPF			0.25	0.01
GASEPV			51.10	1.74
GII			0.01	
GIIB			0.01	0.00
GIV			0.73	0.01
GV			0.23	0.01
HS748A			0.07	0.01
IA1125			0.25	0.03
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25			0.10	0.01
LEAR35			4.08	0.31
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			1.71	0.05
PA28			0.30	0.01
PA30			0.02	
PA31			0.10	0.01
SABR80				
SD330			0.23	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	SGR 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.4	
60		1.0	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.57	0.04
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.05
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			13.95	0.40
C130			0.00	
C130E			0.01	
CIT3			1.91	0.34
CL600			1.89	0.14
CL601			0.47	0.01
CNA172			1.09	0.06
CNA206			1.81	0.04
CNA20T				
CNA441			1.83	0.07
CNA500			3.02	0.82
CNA55B			1.34	1.41
CNA750			1.17	0.03
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.01	
DC6			0.01	
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			1.63	0.86
DHC6QP				
DHC7			0.00	
DHC8			0.00	
DHC830				
EMB120			0.01	
EMB145			0.10	0.01
EMB14L				
F10062			0.45	0.05
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.26	0.01
GASEPV			52.48	1.79
GII				
GIIB				
GIV			0.80	0.01
GV			0.24	0.01
HS748A			0.07	0.01
IA1125			0.26	0.04
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			4.41	0.33
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			1.99	0.06
PA28			0.32	0.01
PA30			0.02	
PA31			0.10	0.01
SABR80				
SD330			0.24	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	T00 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.0	
60		0.1	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D				
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.08
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.03	
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.05	
CNA206			0.02	
CNA20T				
CNA441			0.42	
CNA500				
CNA55B				
CNA750				
COMJET				
COMSEP			0.00	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.01	
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.03	0.01
GASEPV			3.65	0.14
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001				
PA28			0.00	
PA30				
PA31				
SABR80				
SD330				
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	T00 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.0	
60		0.1	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D				
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.09
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.03	
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.05	
CNA206			0.02	
CNA20T				
CNA441			0.47	
CNA500				
CNA55B				
CNA750				
COMJET				
COMSEP			0.01	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.01	
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.04	0.01
GASEPV			4.13	0.16
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35				
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001				
PA28			0.01	
PA30				
PA31				
SABR80				
SD330				
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	T41 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.4	
60		1.2	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.07	
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.08
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.18	0.01
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.24	0.02
CNA206			0.20	0.00
CNA20T				
CNA441			0.03	
CNA500			0.02	
CNA55B			0.00	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.00	
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			11.49	0.08
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.25	0.01
GASEPV			93.25	13.20
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.00	
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001				
PA28			0.09	0.02
PA30			0.04	
PA31			0.03	
SABR80				
SD330			0.01	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	T41 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.5	
60		1.3	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.08	
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.09
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.20	0.02
C130				
C130E				
CIT3				
CL600				
CL601				
CNA172			0.27	0.02
CNA206			0.22	0.00
CNA20T				
CNA441			0.04	
CNA500			0.02	
CNA55B			0.01	
CNA750				
COMJET				
COMSEP				
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3			0.01	
DC6				
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			12.89	0.09
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145				
EMB14L				
F10062				
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.29	0.02
GASEPV			104.64	14.81
GII				
GIIB				
GIV				
GV				
HS748A				
IA1125				
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.01	
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001				
PA28			0.10	0.02
PA30			0.05	
PA31			0.04	
SABR80				
SD330			0.01	
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	TME 2014

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.1	
60		0.2	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.06	0.00
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.08
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.54	0.02
C130				
C130E				
CIT3			0.11	0.01
CL600			0.05	
CL601			0.02	0.00
CNA172			0.04	0.00
CNA206			0.21	0.01
CNA20T				
CNA441			0.17	0.00
CNA500			0.27	0.00
CNA55B			0.26	0.02
CNA750			0.04	
COMJET				
COMSEP			0.00	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6			0.00	
DC820				
DC850				

Aircraft Type	BASE Case Daytime LTO Cycles	BASE Case Nighttime LTO Cycles	ALTERNATIVE Case Daytime LTO Cycles	ALTERNATIVE Case Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.46	0.02
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145			0.01	
EMB14L				
F10062			0.03	
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20			0.01	
GASEPF			0.09	0.01
GASEPV			9.36	0.35
GII			0.01	
GIIB			0.01	
GIV			0.02	0.00
GV			0.01	
HS748A				
IA1125			0.02	
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25			0.01	0.00
LEAR35			0.39	0.01
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.47	0.04
PA28			0.03	0.00
PA30				
PA31			0.02	
SABR80				
SD330			0.02	0.00
SF340				

Area Equivalent Method (AEM) Version 7.0

Airport Name/Code:	TME 2019

DNL (dBA)	Baseline Area (sq.mi.)	Alternative Area (sq.mi.)	Change in Area (sq.mi.)
65		0.1	
60		0.2	

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
1900D			0.06	0.00
707				
707120				
707320				
707QN				
717200				
720				
720B				
727100				
727200				
727D15				
727D17				
727EM1				
727EM2				
727Q15				
727Q7				
727Q9				
727QF				
737				
737300				
7373B2				
737400				
737500				
737700				0.08
737800				
737D17				
737N17				
737N9				
737QN				
747100				
74710Q				
747200				
74720A				
74720B				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
747400				
747SP				
757300				
757PW				
757RR				
767300				
767400				
767CF6				
767JT9				
777200				
777300				
A300-622R				
A300B4-203				
A310-304				
A319-131				
A320-211				
A320-232				
A321-232				
A330-301				
A330-343				
A340-211				
A7D				
BAC111				
BAE146				
BAE300				
BEC58P			0.68	0.02
C130				
C130E				
CIT3			0.12	0.01
CL600			0.05	
CL601			0.02	0.00
CNA172			0.05	0.00
CNA206			0.23	0.01
CNA20T				
CNA441			0.18	0.00
CNA500			0.29	0.01
CNA55B			0.28	0.02
CNA750			0.04	
COMJET				
COMSEP			0.00	
CONCRD				
CVR580				
DC1010				
DC1030				
DC1040				
DC3				
DC6			0.00	
DC820				
DC850				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
DC860				
DC870				
DC8QN				
DC910				
DC930				
DC93LW				
DC950				
DC95HW				
DC9Q7				
DC9Q9				
DHC6			0.48	0.02
DHC6QP				
DHC7				
DHC8				
DHC830				
EMB120				
EMB145			0.01	
EMB14L				
F10062			0.03	
F10065				
F16A				
F16GE				
F16PW0				
F16PW9				
F28MK2				
F28MK4				
F4C				
FAL20				
GASEPF			0.09	0.01
GASEPV			10.76	0.40
GII				
GIIB				
GIV			0.04	0.00
GV			0.01	
HS748A				
IA1125			0.03	
KC135				
KC135B				
KC135R				
L1011				
L10115				
L188				
LEAR25				
LEAR35			0.42	0.01
MD11GE				
MD11PW				
MD81				
MD82				
MD83				

	BASE Case		ALTERNATIVE Case	
Aircraft Type	Daytime LTO Cycles	Nighttime LTO Cycles	Daytime LTO Cycles	Nighttime LTO Cycles
MD9025				
MD9028				
MU3001			0.50	0.04
PA28			0.03	0.00
PA30				
PA31			0.03	
SABR80				
SD330			0.02	0.00
SF340				

David A. Crandall

From:	Roger.McGrath@faa.gov
Sent:	Wednesday, August 01, 2012 10:34
To:	David A. Crandall
Cc:	Diana B. Wasiuk; Gregory.Hines@faa.gov; Kirk C. Harris; Robert D. Behr; Sean M. Doyle; StephenSmith@atac.com; Vinnie Khera
Subject:	Re: HOU OAPM EA - Satellite Airports Recommendation DRAFT

Dave -

After careful consideration of your approach, I agree with your analysis. Leave out CXO, GLS, and TME.

Roger

Roger McGrath
Environmental & Airspace Specialist

FAA, ATO Central Service Center
Airspace and Procedures North Team, AJV-C21
Project/Airspace Management Team, AJV-C23
817-321-7735 (work)
847-477-6038 (cell)
817-321-7744 (fax)

Link to Central Service Center Website

Feedback to Central Service Center: 9-ATO-CSC/ASW/FAA

From:	"David A. Crandall" <dcrandall@hmmh.com>
To:	Roger McGrath/ASW/FAA@FAA
Cc:	Gregory Hines/ASW/FAA@FAA, <StephenSmith@atac.com>, "Sean M. Doyle" <sdoyle@hmmh.com>, <rbehr@hmmh.com>, "Vinnie Khera" <vkhera@hmmh.com>, <kharris@hmmh.com>, "Diana B. Wasiuk" <dwasiuk@hmmh.com>
Date:	07/31/2012 11:59 AM
Subject:	HOU OAPM EA - Satellite Airports Recommendation DRAFT

Roger-
We have prepare a draft memorandum with our recommendation regarding which airports to include in the HOU OAPM EA noise modeling process. (file attached as HOU_OAPM_EA_SatelliteAirportsSelectionMemo_DRAFT_120731_wattachment.pdf)

Per our discussions, this recommendation is based on a detailed interpretation of FAA Order 1050.1E Ch. 1 Appendix A, Sec. 14.6, rather than the typical application using the 700 IFR jets or 90,000 IFR props threshold. All the airports in our recommendation (EFD, DWH, IWS, LBX and SGR) have more than 700 annual IFR jet operations. However, if we used the typical application, we would include three additional airports (CXO, GLS, and TME – all of which have 700+ IFR jet operations).

Please review. We would like your approval to proceed or comments to revise the selection process. In the interest of time, we are progressing through our analysis as if our recommended airports are selected, starting with the most likely to be included regardless of selection methodology (EFD, DWH, SGR…).

Thanks, Dave

David A. Crandall
Principal Consultant

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dcrandall@hmmh.com

 [attachment "HOU_OAPM_EA_SatelliteAirportsSelectionMemo_DRAFT_120731_wattachment.pdf" deleted by Roger McGrath/ASW/FAA]

Appendix B Operation Tables

HOU/IAH 2012 Operations									
APT	**TAF Group**	**Engine Type**	**Aircraft Type**	**NIRS Type: Arrival**	**NIRS Type: Departure**	**Day Arrivals**	**Night Arrivals**	**Day Departures**	**Night Departures**
HOU	AC	Jet	A318	A319-131	A319-131	0.04	0.00	0.04	0.00
HOU	AC	Jet	A319	A319-131	A319-131	1.50	0.90	1.40	0.99
HOU	AC	Jet	A320	A320-211	A320-211	0.00	0.02	0.00	0.02
HOU	AC	Jet	A320	A320-232	A320-232	0.45	0.40	0.56	0.28
HOU	AC	Jet	B712	717200	717200	3.38	0.79	3.40	0.77
HOU	AC	Jet	B733	7373B2	7373B2	46.57	3.68	47.85	2.40
HOU	AC	Jet	B734	737400	737400	0.29	0.00	0.29	0.00
HOU	AC	Jet	B735	737500	737500	10.37	0.87	10.60	0.64
HOU	AC	Jet	B737	737700	737700	62.73	7.78	64.42	6.09
HOU	AC	Jet	B738	737700	737800	0.09	0.01	0.08	0.03
HOU	AC	Jet	CRJ7	CRJ9-ER	CRJ9-ER	0.55	0.00	0.52	0.02
HOU	AC	Jet	CRJ9	CRJ9-ER	CRJ9-ER	4.02	0.94	4.33	0.63
HOU	AC	Jet	CRJ9	CRJ9-LR	CRJ9-LR	0.40	0.08	0.44	0.04
HOU	AC	Jet	DC95	DC95HW	DC95HW	0.62	0.05	0.44	0.24
HOU	AC	Jet	E170	737500	737500	0.29	0.00	0.29	0.00
HOU	AC	Jet	E190	A319-131	A319-131	0.54	0.49	1.03	0.00
HOU	AC	Jet	MD83	MD9025	MD83	0.06	0.00	0.06	0.00
HOU	AC	Jet	MD88	MD9025	MD83	0.38	0.01	0.38	0.01
HOU	AT	Jet	BE40	MU3001	MU3001	0.81	0.00	0.79	0.02
HOU	AT	Jet	C25A	CNA500	CNA500	0.01	0.00	0.01	0.00
HOU	AT	Jet	C25B	CNA500	CNA500	0.52	0.00	0.52	0.00
HOU	AT	Jet	C550	CNA55B	CNA55B	0.11	0.00	0.11	0.00
HOU	AT	Jet	C560	MU3001	MU3001	0.58	0.00	0.56	0.02
HOU	AT	Jet	C56X	CNA55B	CNA55B	4.54	0.16	4.54	0.16
HOU	AT	Jet	C650	CIT3	CIT3	0.27	0.04	0.31	0.00
HOU	AT	Jet	C680	LEAR35	LEAR35	1.57	0.00	1.47	0.10
HOU	AT	Jet	C750	CNA750	CNA750	2.88	0.16	2.89	0.14
HOU	AT	Jet	CL30	CL601	CL601	0.80	0.05	0.85	0.00
HOU	AT	Jet	CL60	CL600	CL600	0.09	0.00	0.09	0.00
HOU	AT	Jet	CL60	CL601	CL601	0.38	0.00	0.38	0.00
HOU	AT	Jet	CRJ2	CL601	CL601	0.09	0.00	0.09	0.00

IAH/HOU NIRS Type Operations Tables for 2012

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	AT	Jet	E135	EMB145	EMB145	2.41	0.01	2.43	0.00
HOU	AT	Jet	E145	EMB145	EMB145	3.26	0.62	3.24	0.63
HOU	AT	Jet	E145	EMB145	EMB14L	3.76	0.71	3.69	0.78
HOU	AT	Jet	E45X	EMB145	EMB14L	0.13	0.00	0.13	0.00
HOU	AT	Jet	E50P	CNA510	CNA510	0.38	0.00	0.38	0.00
HOU	AT	Jet	F2TH	CL600	CL600	0.88	0.05	0.93	0.00
HOU	AT	Jet	FA20	CL600	CL600	0.04	0.00	0.00	0.04
HOU	AT	Jet	FA50	F10062	F10062	0.44	0.01	0.40	0.05
HOU	AT	Jet	GALX	CL600	CL600	0.89	0.04	0.87	0.07
HOU	AT	Jet	H25B	LEAR35	LEAR35	1.38	0.00	1.38	0.00
HOU	AT	Jet	HA4T	CL600	CL600	0.04	0.00	0.04	0.00
HOU	AT	Jet	J328	CL600	CL600	0.00	0.09	0.09	0.00
HOU	AT	Jet	LJ24	LEAR25	LEAR25	0.13	0.00	0.13	0.00
HOU	AT	Jet	LJ35	LEAR35	LEAR35	0.29	0.05	0.24	0.10
HOU	AT	Jet	LJ40	LEAR35	LEAR35	0.40	0.00	0.40	0.00
HOU	AT	Jet	LJ45	LEAR35	LEAR35	0.54	0.00	0.50	0.03
HOU	AT	Jet	LJ60	CNA55B	CNA55B	0.54	0.04	0.54	0.04
HOU	AT	Piston	BE35	GASEPV	GASEPV	0.05	0.00	0.05	0.00
HOU	AT	Piston	BE36	GASEPV	GASEPV	0.71	0.20	0.89	0.01
HOU	AT	Piston	BE58	BEC58P	BEC58P	0.07	0.00	0.07	0.00
HOU	AT	Piston	C172	CNA172	CNA172	0.03	0.00	0.03	0.00
HOU	AT	Piston	C182	CNA182	CNA182	0.06	0.00	0.06	0.00
HOU	AT	Piston	C210	GASEPV	GASEPV	1.15	0.18	0.46	0.88
HOU	AT	Piston	C310	BEC58P	BEC58P	0.14	0.00	0.14	0.00
HOU	AT	Piston	C402	BEC58P	BEC58P	0.02	0.58	0.60	0.00
HOU	AT	Piston	PA32	GASEPV	GASEPV	0.06	0.00	0.06	0.00
HOU	AT	Turbo-prop	BE10	CNA441	CNA441	0.00	0.01	0.01	0.00
HOU	AT	Turbo-prop	BE20	CNA441	CNA441	0.15	0.07	0.12	0.10
HOU	AT	Turbo-prop	BE99	CNA441	CNA441	0.04	0.00	0.04	0.00
HOU	AT	Turbo-prop	BE9L	CNA441	CNA441	0.34	0.00	0.34	0.00
HOU	AT	Turbo-prop	MU2	CNA441	CNA441	0.04	0.00	0.04	0.00

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	AT	Turbo-prop	P180	SD330	SD330	1.56	0.00	1.52	0.04
HOU	AT	Turbo-prop	SW4	DHC6	DHC6	0.09	0.00	0.09	0.00
HOU	GA	Jet	ASTR	IA1125	IA1125	0.53	0.05	0.54	0.04
HOU	GA	Jet	B722	727EM2	727EM2	0.01	0.05	0.06	0.00
HOU	GA	Jet	B737	737700	737700	0.03	0.02	0.05	0.00
HOU	GA	Jet	BE40	MU3001	MU3001	1.07	0.07	1.07	0.08
HOU	GA	Jet	C25A	CNA500	CNA500	0.88	0.08	0.86	0.10
HOU	GA	Jet	C25B	CNA500	CNA500	0.60	0.00	0.60	0.00
HOU	GA	Jet	C25C	CNA500	CNA500	0.36	0.00	0.34	0.02
HOU	GA	Jet	C500	CNA500	CNA500	0.12	0.01	0.12	0.01
HOU	GA	Jet	C501	CNA500	CNA500	0.55	0.02	0.55	0.02
HOU	GA	Jet	C510	CNA510	CNA510	0.64	0.10	0.67	0.08
HOU	GA	Jet	C525	CNA500	CNA500	1.21	0.00	1.12	0.09
HOU	GA	Jet	C550	CNA500	CNA500	0.47	0.02	0.48	0.02
HOU	GA	Jet	C550	CNA55B	CNA55B	0.99	0.07	0.96	0.09
HOU	GA	Jet	C550	MU3001	MU3001	0.41	0.04	0.46	0.00
HOU	GA	Jet	C560	CNA55B	CNA55B	0.14	0.01	0.15	0.00
HOU	GA	Jet	C560	MU3001	MU3001	2.02	0.11	2.03	0.10
HOU	GA	Jet	C56X	CNA55B	CNA55B	1.73	0.08	1.81	0.00
HOU	GA	Jet	C650	CIT3	CIT3	2.04	0.18	2.06	0.16
HOU	GA	Jet	C650	LEAR35	LEAR35	0.03	0.00	0.03	0.00
HOU	GA	Jet	C680	LEAR35	LEAR35	0.35	0.00	0.35	0.00
HOU	GA	Jet	C750	CNA750	CNA750	1.14	0.07	1.14	0.08
HOU	GA	Jet	CL30	CL601	CL601	0.62	0.03	0.60	0.05
HOU	GA	Jet	CL60	CL600	CL600	0.72	0.06	0.69	0.10
HOU	GA	Jet	CL60	CL601	CL601	1.30	0.10	1.33	0.07
HOU	GA	Jet	E135	EMB145	EMB145	0.08	0.00	0.08	0.00
HOU	GA	Jet	E50P	CNA510	CNA510	0.18	0.00	0.18	0.00
HOU	GA	Jet	E55P	CNA55B	CNA55B	0.28	0.00	0.28	0.00
HOU	GA	Jet	EA50	ECLIPSE500	ECLIPSE500	0.21	0.00	0.21	0.00
HOU	GA	Jet	F2TH	CL600	CL600	1.34	0.10	1.44	0.00

IAH/HOU NIRS Type Operations Tables for 2012

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	GA	Jet	F900	F10062	F10062	0.34	0.04	0.36	0.03
HOU	GA	Jet	FA10	LEAR35	LEAR35	0.23	0.04	0.26	0.00
HOU	GA	Jet	FA20	CL600	CL600	0.15	0.00	0.15	0.00
HOU	GA	Jet	FA50	F10062	F10062	0.86	0.05	0.85	0.05
HOU	GA	Jet	FA7X	F10062	F10062	0.04	0.00	0.04	0.00
HOU	GA	Jet	G150	IA1125	IA1125	1.71	0.11	1.77	0.06
HOU	GA	Jet	GALX	CL600	CL600	0.66	0.00	0.60	0.05
HOU	GA	Jet	GLEX	GV	GV	0.11	0.00	0.11	0.00
HOU	GA	Jet	GLF2	GII	GII	0.55	0.00	0.50	0.04
HOU	GA	Jet	GLF2	GIIB	GIIB	0.12	0.00	0.12	0.00
HOU	GA	Jet	GLF3	GIIB	GIIB	0.46	0.00	0.46	0.00
HOU	GA	Jet	GLF4	GIV	GIV	2.72	0.22	2.69	0.25
HOU	GA	Jet	GLF5	GV	GV	0.85	0.09	0.87	0.07
HOU	GA	Jet	H25A	LEAR35	LEAR35	0.24	0.02	0.26	0.00
HOU	GA	Jet	H25B	LEAR35	LEAR35	4.40	0.30	4.19	0.51
HOU	GA	Jet	H25C	LEAR35	LEAR35	0.09	0.00	0.09	0.00
HOU	GA	Jet	HA4T	CL600	CL600	0.20	0.00	0.20	0.00
HOU	GA	Jet	J328	CL600	CL600	0.12	0.00	0.00	0.12
HOU	GA	Jet	LJ25	LEAR25	LEAR25	0.13	0.00	0.13	0.01
HOU	GA	Jet	LJ31	LEAR35	LEAR35	0.67	0.02	0.65	0.04
HOU	GA	Jet	LJ35	LEAR35	LEAR35	0.55	0.00	0.55	0.00
HOU	GA	Jet	LJ40	LEAR35	LEAR35	0.22	0.00	0.22	0.00
HOU	GA	Jet	LJ45	LEAR35	LEAR35	2.80	0.18	2.78	0.20
HOU	GA	Jet	LJ55	LEAR35	LEAR35	0.67	0.09	0.71	0.05
HOU	GA	Jet	LJ60	CNA55B	CNA55B	0.71	0.06	0.73	0.04
HOU	GA	Jet	MU30	MU3001	MU3001	0.13	0.02	0.13	0.03
HOU	GA	Jet	PRM1	LEAR35	LEAR35	0.54	0.00	0.50	0.05
HOU	GA	Jet	SBR1	LEAR35	LEAR35	0.10	0.00	0.10	0.00
HOU	GA	Jet	WW24	IA1125	IA1125	1.30	0.15	1.32	0.13
HOU	GA	Piston	AEST	BEC58P	BEC58P	0.06	0.00	0.06	0.00
HOU	GA	Piston	BE33	GASEPV	GASEPV	0.10	0.00	0.10	0.00

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	GA	Piston	BE35	GASEPV	GASEPV	0.14	0.00	0.14	0.00
HOU	GA	Piston	BE36	GASEPV	GASEPV	0.78	0.00	0.78	0.00
HOU	GA	Piston	BE55	BEC58P	BEC58P	0.21	0.00	0.21	0.00
HOU	GA	Piston	BE58	BEC58P	BEC58P	0.59	0.00	0.59	0.00
HOU	GA	Piston	BE60	BEC58P	BEC58P	0.15	0.00	0.15	0.00
HOU	GA	Piston	C172	CNA172	CNA172	0.23	0.02	0.20	0.05
HOU	GA	Piston	C182	CNA182	CNA182	0.18	0.00	0.18	0.00
HOU	GA	Piston	C206	GASEPV	GASEPV	0.09	0.00	0.09	0.00
HOU	GA	Piston	C210	GASEPV	GASEPV	0.16	0.00	0.16	0.00
HOU	GA	Piston	C310	BEC58P	BEC58P	0.12	0.00	0.12	0.00
HOU	GA	Piston	C340	BEC58P	BEC58P	0.14	0.00	0.14	0.00
HOU	GA	Piston	C414	BEC58P	BEC58P	0.19	0.01	0.18	0.02
HOU	GA	Piston	C421	BEC58P	BEC58P	0.50	0.04	0.43	0.10
HOU	GA	Piston	DA40	GASEPV	GASEPV	0.02	0.00	0.02	0.00
HOU	GA	Piston	LEG2	GASEPV	GASEPV	0.07	0.00	0.07	0.00
HOU	GA	Piston	M20P	GASEPV	GASEPV	0.26	0.00	0.22	0.05
HOU	GA	Piston	M20T	GASEPV	GASEPV	0.06	0.00	0.06	0.00
HOU	GA	Piston	P28A	BEC58P	BEC58P	0.06	0.00	0.06	0.00
HOU	GA	Piston	PA24	GASEPV	GASEPV	0.03	0.00	0.03	0.00
HOU	GA	Piston	PA31	BEC58P	BEC58P	0.23	0.00	0.23	0.00
HOU	GA	Piston	PA32	GASEPV	GASEPV	0.10	0.00	0.10	0.00
HOU	GA	Piston	PA34	BEC58P	BEC58P	0.16	0.03	0.19	0.00
HOU	GA	Piston	PA46	GASEPV	GASEPV	0.23	0.00	0.23	0.00
HOU	GA	Piston	SR20	GASEPV	GASEPV	0.11	0.00	0.11	0.00
HOU	GA	Piston	SR22	GASEPV	GASEPV	0.70	0.00	0.70	0.00
HOU	GA	Turbo-prop	AC90	CNA441	CNA441	0.13	0.00	0.13	0.00
HOU	GA	Turbo-prop	AC95	CNA441	CNA441	0.02	0.00	0.02	0.00
HOU	GA	Turbo-prop	B350	DO228	DO228	2.91	0.20	2.93	0.19
HOU	GA	Turbo-prop	B350	LEAR35	LEAR35	0.00	0.02	0.02	0.00
HOU	GA	Turbo-prop	BE10	CNA441	CNA441	0.17	0.00	0.17	0.00
HOU	GA	Turbo-prop	BE20	CNA441	CNA441	3.60	0.23	3.61	0.22

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	GA	Turbo-prop	BE30	DO228	DO228	0.61	0.03	0.64	0.00
HOU	GA	Turbo-prop	BE9L	CNA441	CNA441	1.43	0.04	1.35	0.11
HOU	GA	Turbo-prop	BE9T	CNA441	CNA441	0.25	0.02	0.27	0.00
HOU	GA	Turbo-prop	C208	CNA208	CNA208	0.16	0.00	0.16	0.00
HOU	GA	Turbo-prop	C425	CNA441	CNA441	0.10	0.00	0.10	0.00
HOU	GA	Turbo-prop	C441	CNA441	CNA441	0.13	0.01	0.12	0.01
HOU	GA	Turbo-prop	MU2	CNA441	CNA441	0.55	0.00	0.49	0.06
HOU	GA	Turbo-prop	P46T	CNA208	CNA208	0.23	0.00	0.23	0.00
HOU	GA	Turbo-prop	PAY1	CNA441	CNA441	0.19	0.00	0.17	0.02
HOU	GA	Turbo-prop	PAY2	CNA441	CNA441	0.26	0.00	0.24	0.02
HOU	GA	Turbo-prop	PC12	CNA208	CNA208	1.67	0.12	1.67	0.12
HOU	GA	Turbo-prop	SW3	CNA441	CNA441	0.13	0.00	0.13	0.00
HOU	GA	Turbo-prop	TBM7	CNA208	CNA208	0.21	0.00	0.19	0.01
HOU	GA	Turbo-prop	TBM8	CNA208	CNA208	0.11	0.01	0.12	0.00
IAH	AC	Jet	A306	A300-622R	A300-622R	0.45	1.54	0.64	1.36
IAH	AC	Jet	A319	A319-131	A319-131	3.54	0.40	3.38	0.56
IAH	AC	Jet	A320	A320-211	A320-211	0.22	0.11	0.24	0.09
IAH	AC	Jet	A320	A320-232	A320-232	1.83	0.84	2.34	0.34
IAH	AC	Jet	B722	727EM2	727EM2	0.00	0.03	0.00	0.03
IAH	AC	Jet	B733	7373B2	7373B2	1.98	1.08	2.26	0.80
IAH	AC	Jet	B734	737400	737400	5.06	0.90	5.34	0.63
IAH	AC	Jet	B735	737500	737500	33.28	2.15	34.97	0.46
IAH	AC	Jet	B737	737700	737700	32.44	2.74	33.20	1.98
IAH	AC	Jet	B738	737700	737800	108.26	12.36	116.18	4.43
IAH	AC	Jet	B739	737700	737800	42.06	4.86	45.84	1.09
IAH	AC	Jet	B742	74720A	74720A	0.04	0.00	0.00	0.04
IAH	AC	Jet	B742	74720B	74720B	0.00	0.02	0.02	0.00
IAH	AC	Jet	B744	747400	747400	2.42	1.52	2.75	1.20
IAH	AC	Jet	B752	757PW	757PW	1.28	0.69	1.46	0.51
IAH	AC	Jet	B752	757RR	757RR	10.79	1.50	11.63	0.66
IAH	AC	Jet	B753	757RR	757300	17.24	2.36	18.94	0.66

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IAH	AC	Jet	B762	767CF6	767CF6	2.20	1.88	3.38	0.70
IAH	AC	Jet	B762	767JT9	767JT9	0.22	0.17	0.16	0.24
IAH	AC	Jet	B763	767300	767300	1.27	0.95	2.00	0.22
IAH	AC	Jet	B764	A330-343	767400	4.99	2.10	6.86	0.24
IAH	AC	Jet	B772	A310-304	777200	6.09	0.26	6.20	0.16
IAH	AC	Jet	B77L	A310-304	777300	0.00	0.00	0.47	0.00
IAH	AC	Jet	B77W	A310-304	777300	2.26	0.00	1.79	0.00
IAH	AC	Jet	CRJ7	CRJ9-ER	CRJ9-ER	33.75	3.64	35.38	2.01
IAH	AC	Jet	CRJ9	CRJ9-ER	CRJ9-ER	8.72	1.55	9.64	0.63
IAH	AC	Jet	CRJ9	CRJ9-LR	CRJ9-LR	4.88	0.38	5.14	0.12
IAH	AC	Jet	DC10	DC1010	DC1010	0.17	0.85	0.21	0.81
IAH	AC	Jet	DC10	DC1030	DC1030	0.05	0.19	0.06	0.17
IAH	AC	Jet	DC87	DC870	DC870	0.73	0.31	0.59	0.46
IAH	AC	Jet	DC95	DC95HW	DC95HW	0.85	0.11	0.96	0.00
IAH	AC	Jet	E170	737500	737500	6.27	0.27	5.68	0.86
IAH	AC	Jet	E190	A319-131	A319-131	0.91	0.00	0.67	0.25
IAH	AC	Jet	MD11	727D17	MD11GE	0.35	0.20	0.02	0.53
IAH	AC	Jet	MD11	727D17	MD11PW	0.24	0.13	0.00	0.37
IAH	AC	Jet	MD82	MD9025	MD82	4.08	0.15	4.24	0.00
IAH	AC	Jet	MD83	MD9025	MD83	1.60	0.06	1.61	0.06
IAH	AC	Jet	MD88	MD9025	MD83	2.55	0.53	2.58	0.50
IAH	AC	Jet	MD90	MD9028	MD9028	0.19	0.00	0.19	0.00
IAH	AC	High-Performance Turbo-Prop	DH8D	DHC830	DHC830	16.45	0.77	16.44	0.78
IAH	AT	Jet	BE40	MU3001	MU3001	0.09	0.00	0.09	0.00
IAH	AT	Jet	C560	MU3001	MU3001	0.38	0.00	0.38	0.00
IAH	AT	Jet	C680	LEAR35	LEAR35	0.29	0.01	0.30	0.00
IAH	AT	Jet	C750	CNA750	CNA750	0.32	0.01	0.34	0.00
IAH	AT	Jet	CRJ2	CL601	CL601	9.54	0.60	9.08	1.06
IAH	AT	Jet	E135	EMB145	EMB145	0.06	0.00	0.07	0.00

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IAH	AT	Jet	E145	EMB145	EMB145	31.71	1.14	32.41	0.43
IAH	AT	Jet	E145	EMB145	EMB14L	133.79	5.33	137.13	1.99
IAH	AT	Jet	E45X	EMB145	EMB14L	107.17	3.28	108.61	1.83
IAH	AT	Jet	F2TH	CL600	CL600	0.15	0.00	0.13	0.02
IAH	AT	Jet	GALX	CL600	CL600	0.07	0.00	0.07	0.00
IAH	AT	Jet	H25B	LEAR35	LEAR35	0.19	0.00	0.19	0.00
IAH	AT	Turbo-prop	SF34	SF340	SF340	43.07	2.77	43.86	1.97
IAH	AT	Turbo-prop	SH36	SD330	SD330	0.74	0.01	0.75	0.00
IAH	AT	Turbo-prop	SW4	DHC6	DHC6	0.69	0.03	0.72	0.00
IAH	GA	Jet	BE40	MU3001	MU3001	0.27	0.00	0.27	0.00
IAH	GA	Jet	C25A	CNA500	CNA500	0.09	0.00	0.09	0.00
IAH	GA	Jet	C25B	CNA500	CNA500	0.03	0.00	0.03	0.00
IAH	GA	Jet	C500	CNA500	CNA500	0.05	0.00	0.05	0.00
IAH	GA	Jet	C525	CNA500	CNA500	0.19	0.00	0.19	0.00
IAH	GA	Jet	C550	CNA500	CNA500	0.07	0.00	0.07	0.00
IAH	GA	Jet	C550	CNA55B	CNA55B	0.07	0.00	0.07	0.00
IAH	GA	Jet	C550	MU3001	MU3001	0.18	0.00	0.18	0.00
IAH	GA	Jet	C560	MU3001	MU3001	1.34	0.00	1.24	0.10
IAH	GA	Jet	C650	CIT3	CIT3	0.19	0.03	0.22	0.00
IAH	GA	Jet	C680	LEAR35	LEAR35	0.82	0.00	0.76	0.07
IAH	GA	Jet	CL30	CL601	CL601	1.33	0.05	1.24	0.14
IAH	GA	Jet	CL60	CL600	CL600	0.04	0.00	0.04	0.00
IAH	GA	Jet	CL60	CL601	CL601	0.17	0.00	0.17	0.00
IAH	GA	Jet	E135	EMB145	EMB145	0.00	0.04	0.04	0.00
IAH	GA	Jet	F2TH	CL600	CL600	0.50	0.00	0.00	0.50
IAH	GA	Jet	F900	F10062	F10062	0.50	0.03	0.49	0.03
IAH	GA	Jet	FA20	CL600	CL600	0.08	0.00	0.08	0.00
IAH	GA	Jet	FA50	F10062	F10062	0.43	0.00	0.43	0.00
IAH	GA	Jet	GALX	CL600	CL600	0.05	0.00	0.05	0.00
IAH	GA	Jet	GLEX	GV	GV	0.27	0.02	0.23	0.06
IAH	GA	Jet	GLF4	GIV	GIV	1.27	0.11	1.28	0.09

IAH/HOU NIRS Type Operations Tables for 2012

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IAH	GA	Jet	GLF5	GV	GV	1.47	0.17	1.51	0.13
IAH	GA	Jet	H25A	LEAR35	LEAR35	0.02	0.00	0.02	0.00
IAH	GA	Jet	H25B	LEAR35	LEAR35	1.07	0.00	1.00	0.06
IAH	GA	Jet	LJ31	LEAR35	LEAR35	0.07	0.00	0.07	0.00
IAH	GA	Jet	LJ35	LEAR35	LEAR35	0.11	0.00	0.11	0.00
IAH	GA	Jet	LJ45	LEAR35	LEAR35	0.70	0.00	0.64	0.07
IAH	GA	Jet	WW24	IA1125	IA1125	0.13	0.00	0.13	0.00
IAH	GA	Piston	BE58	BEC58P	BEC58P	0.18	0.00	0.18	0.00
IAH	GA	Piston	C310	BEC58P	BEC58P	0.17	0.00	0.17	0.00
IAH	GA	Piston	C421	BEC58P	BEC58P	0.30	0.00	0.30	0.00
IAH	GA	Piston	PA32	GASEPV	GASEPV	0.39	0.00	0.39	0.00
IAH	GA	Piston	PA46	GASEPV	GASEPV	0.16	0.00	0.16	0.00
IAH	GA	Piston	SR22	GASEPV	GASEPV	0.39	0.00	0.39	0.00
IAH	GA	Turbo-prop	B350	DO228	DO228	0.30	0.01	0.31	0.00
IAH	GA	Turbo-prop	BE10	CNA441	CNA441	0.04	0.00	0.04	0.00
IAH	GA	Turbo-prop	BE20	CNA441	CNA441	0.66	0.00	0.66	0.00
IAH	GA	Turbo-prop	BE30	DO228	DO228	0.11	0.00	0.11	0.00
IAH	GA	Turbo-prop	BE9L	CNA441	CNA441	0.17	0.00	0.17	0.00
IAH	GA	Turbo-prop	P180	SD330	SD330	0.05	0.00	0.05	0.00

Satellite 2012 Operations								
Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
DWH	Jet	BE40	MU3001	MU3001	1.25	0.05	1.26	0.04
DWH	Jet	C25A	CNA500	CNA500	0.10	0.00	0.10	0.00
DWH	Jet	C25B	CNA500	CNA500	0.17	0.00	0.17	0.00
DWH	Jet	C500	CNA500	CNA500	0.08	0.00	0.08	0.00
DWH	Jet	C501	CNA500	CNA500	0.13	0.00	0.13	0.00
DWH	Jet	C510	CNA510	CNA510	0.48	0.05	0.53	0.00
DWH	Jet	C525	CNA500	CNA500	0.23	0.01	0.24	0.00
DWH	Jet	C550	CNA500	CNA500	0.12	0.00	0.12	0.00
DWH	Jet	C550	CNA55B	CNA55B	0.22	0.02	0.24	0.00
DWH	Jet	C550	MU3001	MU3001	0.15	0.01	0.00	0.16
DWH	Jet	C560	MU3001	MU3001	0.64	0.08	0.67	0.04
DWH	Jet	C56X	CNA55B	CNA55B	1.34	0.00	1.34	0.00
DWH	Jet	C650	CIT3	CIT3	0.31	0.00	0.31	0.00
DWH	Jet	C680	LEAR35	LEAR35	0.40	0.00	0.40	0.00
DWH	Jet	C750	CNA750	CNA750	0.32	0.00	0.32	0.00
DWH	Jet	CL30	CL601	CL601	0.13	0.00	0.13	0.00
DWH	Jet	CL60	CL601	CL601	0.17	0.01	0.18	0.00
DWH	Jet	E135	EMB145	EMB145	0.02	0.00	0.02	0.00
DWH	Jet	E55P	CNA55B	CNA55B	0.02	0.00	0.02	0.00
DWH	Jet	EA50	ECLIPSE500	ECLIPSE500	0.06	0.00	0.06	0.00
DWH	Jet	F2TH	CL600	CL600	0.15	0.00	0.15	0.00
DWH	Jet	FA20	CL600	CL600	0.25	0.00	0.25	0.00
DWH	Jet	FA50	F10062	F10062	0.10	0.00	0.10	0.00
DWH	Jet	GALX	CL600	CL600	0.11	0.00	0.11	0.00
DWH	Jet	GLF4	GIV	GIV	0.47	0.11	0.58	0.00
DWH	Jet	H25B	LEAR35	LEAR35	0.42	0.00	0.42	0.00
DWH	Jet	LJ31	LEAR35	LEAR35	0.08	0.00	0.08	0.00
DWH	Jet	LJ35	LEAR35	LEAR35	0.08	0.00	0.08	0.00
DWH	Jet	LJ45	LEAR35	LEAR35	0.16	0.00	0.16	0.00
DWH	Jet	LJ55	LEAR35	LEAR35	0.03	0.00	0.03	0.00
DWH	Jet	LJ60	CNA55B	CNA55B	0.37	0.00	0.34	0.03

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
DWH	Jet	PRM1	LEAR35	LEAR35	0.08	0.00	0.08	0.00
DWH	Jet	SBR1	LEAR35	LEAR35	0.37	0.00	0.30	0.07
DWH	Jet	WW24	IA1125	IA1125	0.16	0.00	0.15	0.01
DWH	Piston	AA5	GASEPF	GASEPF	0.06	0.00	0.06	0.00
DWH	Piston	AC11	GASEPV	GASEPV	0.05	0.00	0.05	0.00
DWH	Piston	AEST	BEC58P	BEC58P	0.06	0.00	0.06	0.00
DWH	Piston	B36T	GASEPV	GASEPV	0.01	0.00	0.01	0.00
DWH	Piston	BE33	GASEPV	GASEPV	0.26	0.00	0.26	0.00
DWH	Piston	BE35	GASEPV	GASEPV	0.40	0.00	0.40	0.00
DWH	Piston	BE36	GASEPV	GASEPV	1.05	0.00	1.05	0.00
DWH	Piston	BE55	BEC58P	BEC58P	0.46	0.00	0.46	0.00
DWH	Piston	BE58	BEC58P	BEC58P	0.38	0.00	0.38	0.00
DWH	Piston	BL17	GASEPV	GASEPV	0.03	0.00	0.03	0.00
DWH	Piston	C172	CNA172	CNA172	3.40	0.14	3.54	0.00
DWH	Piston	C177	CNA172	CNA172	0.05	0.00	0.05	0.00
DWH	Piston	C182	CNA182	CNA182	1.23	0.04	1.28	0.00
DWH	Piston	C206	GASEPV	GASEPV	0.25	0.00	0.25	0.00
DWH	Piston	C210	GASEPV	GASEPV	0.65	0.00	0.65	0.00
DWH	Piston	C310	BEC58P	BEC58P	0.29	0.00	0.25	0.04
DWH	Piston	C340	BEC58P	BEC58P	0.07	0.00	0.07	0.00
DWH	Piston	C402	BEC58P	BEC58P	0.13	0.00	0.13	0.00
DWH	Piston	C414	BEC58P	BEC58P	0.28	0.00	0.28	0.00
DWH	Piston	C421	BEC58P	BEC58P	0.52	0.00	0.52	0.00
DWH	Piston	C72R	CNA172	CNA172	0.08	0.00	0.08	0.00
DWH	Piston	C82R	CNA182	CNA182	0.06	0.00	0.06	0.00
DWH	Piston	COL3	GASEPV	GASEPV	0.20	0.00	0.20	0.00
DWH	Piston	COL4	GASEPV	GASEPV	0.20	0.00	0.20	0.00
DWH	Piston	M200	GASEPV	GASEPV	0.03	0.00	0.03	0.00
DWH	Piston	M20P	GASEPV	GASEPV	0.50	0.00	0.50	0.00
DWH	Piston	P28A	BEC58P	BEC58P	0.43	0.00	0.43	0.00
DWH	Piston	P28R	GASEPV	GASEPV	0.10	0.00	0.10	0.00

Satellite Airport NIRS Type Operations Tables for 2012

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
DWH	Piston	P32R	GASEPV	GASEPV	0.16	0.00	0.16	0.00
DWH	Piston	P32T	GASEPV	GASEPV	0.10	0.00	0.10	0.00
DWH	Piston	PA24	GASEPV	GASEPV	0.11	0.00	0.11	0.00
DWH	Piston	PA32	GASEPV	GASEPV	0.35	0.00	0.35	0.00
DWH	Piston	PA34	BEC58P	BEC58P	0.12	0.00	0.12	0.00
DWH	Piston	PA44	BEC58P	BEC58P	0.90	0.10	1.00	0.00
DWH	Piston	PA46	GASEPV	GASEPV	0.23	0.00	0.23	0.00
DWH	Piston	SR20	GASEPV	GASEPV	0.05	0.00	0.05	0.00
DWH	Piston	SR22	GASEPV	GASEPV	1.10	0.08	1.09	0.10
DWH	Piston	T34T	GASEPV	GASEPV	0.36	0.00	0.36	0.00
DWH	Piston	TEX2	GASEPV	GASEPV	0.37	0.00	0.37	0.00
DWH	Turbo-Prop	AC90	CNA441	CNA441	0.05	0.00	0.05	0.00
DWH	Turbo-Prop	B350	DO228	DO228	0.32	0.01	0.33	0.00
DWH	Turbo-Prop	BE10	CNA441	CNA441	0.04	0.00	0.04	0.00
DWH	Turbo-Prop	BE20	CNA441	CNA441	1.36	0.13	1.49	0.00
DWH	Turbo-Prop	BE30	DO228	DO228	0.30	0.00	0.30	0.00
DWH	Turbo-Prop	BE9L	CNA441	CNA441	0.61	0.00	0.61	0.00
DWH	Turbo-Prop	BE9T	CNA441	CNA441	0.01	0.00	0.01	0.00
DWH	Turbo-Prop	C425	CNA441	CNA441	0.04	0.00	0.04	0.00
DWH	Turbo-Prop	C441	CNA441	CNA441	0.05	0.00	0.05	0.00
DWH	Turbo-Prop	P180	SD330	SD330	0.30	0.00	0.30	0.00
DWH	Turbo-Prop	P46T	CNA208	CNA208	0.47	0.04	0.49	0.03
DWH	Turbo-Prop	PC12	CNA208	CNA208	1.31	0.12	1.29	0.15
DWH	Turbo-Prop	SW3	CNA441	CNA441	0.17	0.00	0.16	0.01
DWH	Turbo-Prop	TBM7	CNA208	CNA208	0.21	0.00	0.20	0.00
DWH	Turbo-Prop	TBM8	CNA208	CNA208	0.26	0.00	0.26	0.00
EFD	Jet	B722	727EM2	727EM2	0.19	0.00	0.19	0.00
EFD	Jet	BE40	MU3001	MU3001	0.93	0.40	1.33	0.00
EFD	Jet	C25A	CNA500	CNA500	0.11	0.00	0.11	0.00
EFD	Jet	C25B	CNA500	CNA500	0.31	0.00	0.31	0.00
EFD	Jet	C500	CNA500	CNA500	0.00	0.00	0.00	0.00

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
EFD	Jet	C501	CNA500	CNA500	0.04	0.00	0.04	0.00
EFD	Jet	C525	CNA500	CNA500	0.09	0.00	0.09	0.00
EFD	Jet	C550	MU3001	MU3001	0.30	0.00	0.30	0.00
EFD	Jet	C560	MU3001	MU3001	0.56	0.00	0.56	0.00
EFD	Jet	C56X	CNA55B	CNA55B	0.24	0.00	0.24	0.00
EFD	Jet	C650	CIT3	CIT3	0.23	0.00	0.23	0.00
EFD	Jet	C680	LEAR35	LEAR35	0.13	0.00	0.13	0.00
EFD	Jet	C750	CNA750	CNA750	0.09	0.00	0.09	0.00
EFD	Jet	CL60	CL601	CL601	0.12	0.00	0.12	0.00
EFD	Jet	E135	EMB145	EMB145	0.06	0.00	0.06	0.00
EFD	Jet	E6	DC870	DC870	0.02	0.00	0.02	0.00
EFD	Jet	EA50	ECLIPSE500	ECLIPSE500	0.18	0.01	0.19	0.00
EFD	Jet	F16	LEAR25	LEAR25	0.75	0.00	0.75	0.00
EFD	Jet	F18	A7D	LEAR25	0.42	0.00	0.42	0.00
EFD	Jet	FA18	A7D	LEAR25	0.02	0.00	0.02	0.00
EFD	Jet	FA20	CL600	CL600	0.22	0.00	0.22	0.00
EFD	Jet	G150	IA1125	IA1125	1.17	0.03	1.20	0.00
EFD	Jet	GL5T	GV	GV	0.00	0.00	0.00	0.00
EFD	Jet	GLF2	GIIB	GIIB	0.42	0.00	0.42	0.00
EFD	Jet	GLF4	GIV	GIV	0.19	0.00	0.19	0.00
EFD	Jet	H25B	LEAR35	LEAR35	0.62	0.03	0.61	0.04
EFD	Jet	HAWK	A7D	A7D	0.94	0.00	0.94	0.00
EFD	Jet	LJ35	LEAR35	LEAR35	0.04	0.00	0.04	0.00
EFD	Jet	LJ60	CNA55B	CNA55B	0.40	0.00	0.40	0.00
EFD	Jet	MD82	MD9025	MD82	0.00	0.00	0.00	0.00
EFD	Jet	MD83	MD9025	MD83	0.21	0.00	0.21	0.00
EFD	Jet	SBR1	LEAR35	LEAR35	0.05	0.00	0.04	0.00
EFD	Jet	T38	LEAR25	LEAR25	8.76	0.21	8.97	0.00
EFD	Piston	BE35	GASEPV	GASEPV	0.18	0.00	0.18	0.00
EFD	Piston	BE36	GASEPV	GASEPV	0.38	0.00	0.38	0.00
EFD	Piston	BE55	BEC58P	BEC58P	0.13	0.00	0.13	0.00

Satellite Airport NIRS Type Operations Tables for 2012

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
EFD	Piston	BE58	BEC58P	BEC58P	0.41	0.07	0.48	0.00
EFD	Piston	C177	CNA172	CNA172	0.03	0.00	0.03	0.00
EFD	Piston	C182	CNA182	CNA182	0.46	0.00	0.41	0.04
EFD	Piston	C210	GASEPV	GASEPV	0.42	0.00	0.30	0.12
EFD	Piston	C340	BEC58P	BEC58P	0.15	0.00	0.15	0.00
EFD	Piston	C402	BEC58P	BEC58P	0.01	0.00	0.01	0.00
EFD	Piston	C414	BEC58P	BEC58P	0.26	0.00	0.26	0.00
EFD	Piston	C421	BEC58P	BEC58P	1.01	0.00	1.01	0.00
EFD	Piston	COL4	GASEPV	GASEPV	0.21	0.00	0.21	0.00
EFD	Piston	DA40	GASEPV	GASEPV	0.16	0.01	0.18	0.00
EFD	Piston	DA42	BEC58P	BEC58P	0.01	0.00	0.01	0.00
EFD	Piston	M20P	GASEPV	GASEPV	0.46	0.00	0.44	0.02
EFD	Piston	P28A	BEC58P	BEC58P	0.16	0.00	0.16	0.00
EFD	Piston	P28R	GASEPV	GASEPV	0.19	0.00	0.17	0.02
EFD	Piston	P32R	GASEPV	GASEPV	0.13	0.00	0.13	0.00
EFD	Piston	P32T	GASEPV	GASEPV	0.04	0.00	0.04	0.00
EFD	Piston	PA31	BEC58P	BEC58P	0.24	0.00	0.24	0.00
EFD	Piston	PA32	GASEPV	GASEPV	0.31	0.00	0.30	0.01
EFD	Piston	PA44	BEC58P	BEC58P	0.33	0.00	0.33	0.00
EFD	Piston	PA46	GASEPV	GASEPV	0.20	0.00	0.20	0.00
EFD	Piston	SR20	GASEPV	GASEPV	1.16	0.00	1.16	0.00
EFD	Piston	SR22	GASEPV	GASEPV	1.01	0.00	1.01	0.00
EFD	Piston	T18	GASEPV	GASEPV	0.04	0.00	0.04	0.00
EFD	Piston	T34T	GASEPV	GASEPV	0.36	0.00	0.36	0.00
EFD	Turbo-Prop	BE20	CNA441	CNA441	0.63	0.00	0.63	0.00
EFD	Turbo-Prop	BE9L	CNA441	CNA441	0.71	0.00	0.65	0.06
EFD	Turbo-Prop	C130	C130	C130	0.35	0.00	0.35	0.00
EFD	Turbo-Prop	C441	CNA441	CNA441	0.11	0.00	0.11	0.00
EFD	Turbo-Prop	MU2	CNA441	CNA441	0.16	0.00	0.16	0.00
EFD	Turbo-Prop	P46T	CNA208	CNA208	0.20	0.00	0.20	0.00
EFD	Turbo-Prop	PC12	CNA208	CNA208	0.25	0.02	0.26	0.01

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
EFD	Turbo-Prop	TBM7	CNA208	CNA208	0.10	0.00	0.10	0.00
IWS	Jet	C25C	CNA500	CNA500	0.23	0.00	0.23	0.00
IWS	Jet	C501	CNA500	CNA500	0.09	0.00	0.09	0.00
IWS	Jet	C510	CNA510	CNA510	0.88	0.00	0.88	0.00
IWS	Jet	C525	CNA500	CNA500	0.19	0.01	0.19	0.01
IWS	Jet	C550	MU3001	MU3001	0.26	0.00	0.26	0.00
IWS	Jet	LJ40	LEAR35	LEAR35	0.03	0.00	0.03	0.00
IWS	Piston	BE33	GASEPV	GASEPV	0.41	0.00	0.39	0.02
IWS	Piston	BE35	GASEPV	GASEPV	0.70	0.00	0.70	0.00
IWS	Piston	BE36	GASEPV	GASEPV	1.31	0.00	1.31	0.00
IWS	Piston	BE55	BEC58P	BEC58P	0.71	0.00	0.68	0.03
IWS	Piston	BE58	BEC58P	BEC58P	1.54	0.00	1.54	0.00
IWS	Piston	BE60	BEC58P	BEC58P	0.00	0.26	0.26	0.00
IWS	Piston	C172	CNA172	CNA172	0.60	0.00	0.60	0.00
IWS	Piston	C182	CNA182	CNA182	1.23	0.00	1.15	0.09
IWS	Piston	C206	GASEPV	GASEPV	0.27	0.00	0.27	0.00
IWS	Piston	C320	BEC58P	BEC58P	0.00	0.00	0.00	0.00
IWS	Piston	C340	BEC58P	BEC58P	0.21	0.00	0.21	0.00
IWS	Piston	C414	BEC58P	BEC58P	0.14	0.00	0.14	0.00
IWS	Piston	C421	BEC58P	BEC58P	0.69	0.00	0.67	0.02
IWS	Piston	COL3	GASEPV	GASEPV	0.06	0.00	0.06	0.00
IWS	Piston	DA40	GASEPV	GASEPV	0.11	0.00	0.11	0.00
IWS	Piston	M20P	GASEPV	GASEPV	0.30	0.02	0.32	0.00
IWS	Piston	P28B	BEC58P	BEC58P	0.12	0.00	0.12	0.00
IWS	Piston	P28R	GASEPV	GASEPV	0.07	0.00	0.07	0.00
IWS	Piston	P32R	GASEPV	GASEPV	0.33	0.00	0.32	0.01
IWS	Piston	P32T	GASEPV	GASEPV	0.07	0.00	0.07	0.00
IWS	Piston	PA24	GASEPV	GASEPV	0.27	0.00	0.27	0.00
IWS	Piston	PA31	BEC58P	BEC58P	0.11	0.00	0.11	0.00
IWS	Piston	PA32	GASEPV	GASEPV	0.56	0.00	0.56	0.00
IWS	Piston	PA46	GASEPV	GASEPV	1.10	0.00	1.03	0.07

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IWS	Piston	SR22	GASEPV	GASEPV	0.79	0.01	0.77	0.02
IWS	Turbo-Prop	B350	DO228	DO228	0.21	0.00	0.21	0.00
IWS	Turbo-Prop	BE20	CNA441	CNA441	1.52	0.02	1.49	0.05
IWS	Turbo-Prop	BE9L	CNA441	CNA441	0.51	0.00	0.47	0.05
IWS	Turbo-Prop	BE9T	CNA441	CNA441	0.04	0.00	0.04	0.00
IWS	Turbo-Prop	C208	CNA208	CNA208	0.29	0.00	0.29	0.00
IWS	Turbo-Prop	C425	CNA441	CNA441	0.44	0.00	0.43	0.01
IWS	Turbo-Prop	C441	CNA441	CNA441	0.25	0.00	0.25	0.00
IWS	Turbo-Prop	P46T	CNA208	CNA208	0.53	0.00	0.53	0.00
IWS	Turbo-Prop	PC12	CNA208	CNA208	1.70	0.00	1.70	0.00
IWS	Turbo-Prop	SW3	CNA441	CNA441	0.04	0.00	0.04	0.00
LBX	Jet	C25B	CNA500	CNA500	0.00	0.02	0.02	0.00
LBX	Jet	C525	CNA500	CNA500	0.11	0.00	0.11	0.00
LBX	Jet	C560	MU3001	MU3001	0.06	0.00	0.06	0.00
LBX	Jet	CRJ7	CRJ9-ER	CRJ9-ER	3.56	0.00	3.56	0.00
LBX	Jet	F2TH	CL600	CL600	0.08	0.00	0.08	0.00
LBX	Jet	H25B	LEAR35	LEAR35	0.08	0.02	0.10	0.00
LBX	Jet	LJ55	LEAR35	LEAR35	0.00	0.01	0.00	0.01
LBX	Piston	BE35	GASEPV	GASEPV	0.14	0.00	0.14	0.00
LBX	Piston	C172	CNA172	CNA172	0.44	0.00	0.44	0.00
LBX	Piston	C182	CNA182	CNA182	0.27	0.00	0.27	0.00
LBX	Piston	C210	GASEPV	GASEPV	1.86	0.00	0.46	1.40
LBX	Piston	PA24	GASEPV	GASEPV	0.57	0.00	0.17	0.40
SGR	Jet	BE40	MU3001	MU3001	0.72	0.00	0.72	0.00
SGR	Jet	C25A	CNA500	CNA500	0.36	0.00	0.36	0.00
SGR	Jet	C25B	CNA500	CNA500	0.73	0.02	0.71	0.04
SGR	Jet	C501	CNA500	CNA500	0.42	0.00	0.41	0.02
SGR	Jet	C525	CNA500	CNA500	0.73	0.00	0.73	0.00
SGR	Jet	C550	CNA55B	CNA55B	0.27	0.00	0.27	0.00
SGR	Jet	C550	MU3001	MU3001	0.32	0.00	0.32	0.00
SGR	Jet	C560	MU3001	MU3001	1.03	0.03	1.03	0.04

Satellite Airport NIRS Type Operations Tables for 2012

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
SGR	Jet	C56X	CNA55B	CNA55B	1.69	0.06	1.70	0.05
SGR	Jet	C650	CIT3	CIT3	2.08	0.10	1.62	0.55
SGR	Jet	C680	LEAR35	LEAR35	0.90	0.00	0.90	0.00
SGR	Jet	C750	CNA750	CNA750	1.10	0.05	1.10	0.06
SGR	Jet	CL30	CL601	CL601	0.43	0.00	0.40	0.03
SGR	Jet	CL60	CL600	CL600	0.19	0.00	0.17	0.02
SGR	Jet	CL60	CL601	CL601	0.32	0.02	0.35	0.00
SGR	Jet	E135	EMB145	EMB145	0.09	0.01	0.10	0.00
SGR	Jet	E50P	CNA510	CNA510	0.48	0.59	0.00	1.07
SGR	Jet	E55P	CNA55B	CNA55B	0.13	0.00	0.13	0.00
SGR	Jet	EA50	ECLIPSE500	ECLIPSE500	0.17	0.00	0.17	0.00
SGR	Jet	F2TH	CL600	CL600	0.94	0.06	0.99	0.00
SGR	Jet	F900	F10062	F10062	0.26	0.00	0.26	0.00
SGR	Jet	FA10	LEAR35	LEAR35	0.05	0.00	0.05	0.00
SGR	Jet	FA20	CL600	CL600	0.18	0.00	0.18	0.00
SGR	Jet	FA50	F10062	F10062	0.20	0.00	0.20	0.00
SGR	Jet	GALX	CL600	CL600	0.45	0.00	0.45	0.00
SGR	Jet	GLEX	GV	GV	0.05	0.00	0.05	0.00
SGR	Jet	GLF4	GIV	GIV	0.75	0.00	0.75	0.00
SGR	Jet	GLF5	GV	GV	0.18	0.00	0.18	0.00
SGR	Jet	H25A	LEAR35	LEAR35	0.01	0.00	0.01	0.00
SGR	Jet	H25B	LEAR35	LEAR35	0.80	0.00	0.80	0.00
SGR	Jet	H25C	LEAR35	LEAR35	0.00	0.00	0.00	0.00
SGR	Jet	LJ35	LEAR35	LEAR35	0.20	0.00	0.20	0.00
SGR	Jet	LJ40	LEAR35	LEAR35	0.36	0.00	0.36	0.00
SGR	Jet	LJ45	LEAR35	LEAR35	0.64	0.05	0.65	0.04
SGR	Jet	LJ55	LEAR35	LEAR35	0.09	0.00	0.09	0.00
SGR	Jet	LJ60	CNA55B	CNA55B	1.00	0.06	0.93	0.13
SGR	Jet	PRM1	LEAR35	LEAR35	0.22	0.00	0.21	0.00
SGR	Jet	WW24	IA1125	IA1125	0.19	0.04	0.23	0.00
SGR	Piston	AC50	BEC58P	BEC58P	0.87	0.00	0.87	0.00

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
SGR	Piston	AEST	BEC58P	BEC58P	0.13	0.00	0.13	0.00
SGR	Piston	BE33	GASEPV	GASEPV	0.07	0.00	0.07	0.00
SGR	Piston	BE35	GASEPV	GASEPV	0.34	0.00	0.34	0.00
SGR	Piston	BE36	GASEPV	GASEPV	0.42	0.00	0.41	0.01
SGR	Piston	BE55	BEC58P	BEC58P	0.29	0.00	0.29	0.00
SGR	Piston	BE58	BEC58P	BEC58P	0.30	0.00	0.30	0.00
SGR	Piston	BE60	BEC58P	BEC58P	0.13	0.00	0.13	0.00
SGR	Piston	C172	CNA172	CNA172	1.10	0.04	1.09	0.05
SGR	Piston	C182	CNA182	CNA182	0.70	0.00	0.70	0.00
SGR	Piston	C206	GASEPV	GASEPV	0.24	0.00	0.24	0.00
SGR	Piston	C210	GASEPV	GASEPV	0.47	0.00	0.47	0.00
SGR	Piston	C310	BEC58P	BEC58P	0.15	0.00	0.15	0.00
SGR	Piston	C340	BEC58P	BEC58P	0.11	0.00	0.11	0.00
SGR	Piston	C414	BEC58P	BEC58P	0.52	0.00	0.50	0.01
SGR	Piston	C421	BEC58P	BEC58P	0.66	0.02	0.67	0.01
SGR	Piston	COL3	GASEPV	GASEPV	0.05	0.00	0.05	0.00
SGR	Piston	COL4	GASEPV	GASEPV	0.27	0.00	0.27	0.00
SGR	Piston	DA40	GASEPV	GASEPV	0.02	0.00	0.02	0.00
SGR	Piston	M20P	GASEPV	GASEPV	0.31	0.00	0.31	0.00
SGR	Piston	M20T	GASEPV	GASEPV	0.26	0.00	0.26	0.00
SGR	Piston	P28A	BEC58P	BEC58P	0.08	0.00	0.08	0.00
SGR	Piston	P28R	GASEPV	GASEPV	0.23	0.00	0.23	0.00
SGR	Piston	P32R	GASEPV	GASEPV	0.06	0.00	0.06	0.00
SGR	Piston	PA23	BEC58P	BEC58P	0.03	0.00	0.03	0.00
SGR	Piston	PA24	GASEPV	GASEPV	0.03	0.00	0.03	0.00
SGR	Piston	PA31	BEC58P	BEC58P	0.11	0.00	0.11	0.00
SGR	Piston	PA32	GASEPV	GASEPV	0.22	0.00	0.22	0.00
SGR	Piston	PA34	BEC58P	BEC58P	0.07	0.00	0.07	0.00
SGR	Piston	PA44	BEC58P	BEC58P	0.13	0.00	0.12	0.01
SGR	Piston	PA46	GASEPV	GASEPV	0.25	0.00	0.25	0.00
SGR	Piston	SR22	GASEPV	GASEPV	1.19	0.06	1.25	0.00

Satellite Airport NIRS Type Operations Tables for 2012

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
SGR	Turbo-Prop	AC90	CNA441	CNA441	0.32	0.09	0.30	0.11
SGR	Turbo-Prop	B350	DO228	DO228	0.37	0.00	0.36	0.01
SGR	Turbo-Prop	BE10	CNA441	CNA441	0.04	0.00	0.03	0.00
SGR	Turbo-Prop	BE20	CNA441	CNA441	1.83	0.09	1.48	0.45
SGR	Turbo-Prop	BE30	DO228	DO228	0.08	0.00	0.08	0.00
SGR	Turbo-Prop	BE9L	CNA441	CNA441	0.33	0.01	0.34	0.00
SGR	Turbo-Prop	C425	CNA441	CNA441	0.13	0.00	0.13	0.00
SGR	Turbo-Prop	C441	CNA441	CNA441	0.37	0.00	0.35	0.02
SGR	Turbo-Prop	G159	HS748A	HS748A	0.04	0.00	0.04	0.00
SGR	Turbo-Prop	MU2	CNA441	CNA441	0.00	0.06	0.00	0.06
SGR	Turbo-Prop	P180	SD330	SD330	0.42	0.00	0.42	0.00
SGR	Turbo-Prop	P46T	CNA208	CNA208	0.14	0.00	0.14	0.00
SGR	Turbo-Prop	PC12	CNA208	CNA208	0.27	0.00	0.27	0.00
SGR	Turbo-Prop	SW3	CNA441	CNA441	0.15	0.00	0.15	0.00
SGR	Turbo-Prop	SW4	DHC6	DHC6	0.14	0.00	0.14	0.00
SGR	Turbo-Prop	TBM7	CNA208	CNA208	0.07	0.00	0.07	0.00

HOU/IAH 2014 Operations									
APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	AC	Jet	A318	A319-131	A319-131	0.04	0.00	0.04	0.00
HOU	AC	Jet	A319	A319-131	A319-131	1.54	0.92	1.45	1.02
HOU	AC	Jet	A320	A320-211	A320-211	0.00	0.02	0.00	0.02
HOU	AC	Jet	A320	A320-232	A320-232	0.46	0.41	0.58	0.29
HOU	AC	Jet	B712	717200	717200	3.38	0.79	3.40	0.77
HOU	AC	Jet	B733	7373B2	7373B2	46.57	3.68	47.85	2.40
HOU	AC	Jet	B734	737400	737400	0.29	0.00	0.29	0.00
HOU	AC	Jet	B735	737500	737500	10.37	0.87	10.60	0.64
HOU	AC	Jet	B737	737700	737700	64.56	8.01	66.30	6.27
HOU	AC	Jet	B738	737700	737800	0.10	0.01	0.08	0.03
HOU	AC	Jet	CRJ7	CRJ9-ER	CRJ9-ER	0.56	0.00	0.54	0.02
HOU	AC	Jet	CRJ9	CRJ9-ER	CRJ9-ER	4.14	0.96	4.46	0.65
HOU	AC	Jet	CRJ9	CRJ9-LR	CRJ9-LR	0.41	0.08	0.45	0.04
HOU	AC	Jet	DC95	DC95HW	DC95HW	0.62	0.05	0.44	0.24
HOU	AC	Jet	E170	737500	737500	0.30	0.00	0.30	0.00
HOU	AC	Jet	E190	A319-131	A319-131	0.55	0.51	1.06	0.00
HOU	AC	Jet	MD83	MD9025	MD83	0.06	0.00	0.06	0.00
HOU	AC	Jet	MD88	MD9025	MD83	0.38	0.01	0.38	0.01
HOU	AT	Jet	BE40	MU3001	MU3001	0.84	0.00	0.82	0.02
HOU	AT	Jet	C25A	CNA500	CNA500	0.01	0.00	0.01	0.00
HOU	AT	Jet	C25B	CNA500	CNA500	0.54	0.00	0.54	0.00
HOU	AT	Jet	C550	CNA55B	CNA55B	0.11	0.00	0.11	0.00
HOU	AT	Jet	C560	MU3001	MU3001	0.61	0.00	0.58	0.03
HOU	AT	Jet	C56X	CNA55B	CNA55B	4.72	0.17	4.73	0.17
HOU	AT	Jet	C650	CIT3	CIT3	0.27	0.04	0.31	0.00
HOU	AT	Jet	C680	LEAR35	LEAR35	1.63	0.00	1.53	0.10
HOU	AT	Jet	C750	CNA750	CNA750	3.00	0.16	3.01	0.15
HOU	AT	Jet	CL30	CL601	CL601	0.83	0.06	0.89	0.00
HOU	AT	Jet	CL60	CL600	CL600	0.09	0.00	0.09	0.00
HOU	AT	Jet	CL60	CL601	CL601	0.39	0.00	0.39	0.00
HOU	AT	Jet	CRJ2	CL601	CL601	0.09	0.00	0.09	0.00

IAH/HOU NIRS Type Operations Tables for 2014

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	AT	Jet	E135	EMB145	EMB145	2.41	0.01	2.43	0.00
HOU	AT	Jet	E145	EMB145	EMB145	3.39	0.64	3.38	0.66
HOU	AT	Jet	E145	EMB145	EMB14L	3.91	0.74	3.84	0.81
HOU	AT	Jet	E45X	EMB145	EMB14L	0.13	0.00	0.13	0.00
HOU	AT	Jet	E50P	CNA510	CNA510	0.40	0.00	0.40	0.00
HOU	AT	Jet	F2TH	CL600	CL600	0.91	0.05	0.97	0.00
HOU	AT	Jet	FA20	CL600	CL600	0.04	0.00	0.00	0.04
HOU	AT	Jet	FA50	F10062	F10062	0.44	0.01	0.40	0.05
HOU	AT	Jet	GALX	CL600	CL600	0.89	0.04	0.87	0.07
HOU	AT	Jet	H25B	LEAR35	LEAR35	1.43	0.00	1.43	0.00
HOU	AT	Jet	HA4T	CL600	CL600	0.05	0.00	0.05	0.00
HOU	AT	Jet	J328	CL600	CL600	0.00	0.09	0.09	0.00
HOU	AT	Jet	LJ24	LEAR25	LEAR25	0.13	0.00	0.13	0.00
HOU	AT	Jet	LJ35	LEAR35	LEAR35	0.29	0.05	0.24	0.10
HOU	AT	Jet	LJ40	LEAR35	LEAR35	0.42	0.00	0.42	0.00
HOU	AT	Jet	LJ45	LEAR35	LEAR35	0.54	0.00	0.50	0.03
HOU	AT	Jet	LJ60	CNA55B	CNA55B	0.56	0.05	0.56	0.05
HOU	AT	Piston	BE35	GASEPV	GASEPV	0.05	0.00	0.05	0.00
HOU	AT	Piston	BE36	GASEPV	GASEPV	0.71	0.20	0.89	0.01
HOU	AT	Piston	BE58	BEC58P	BEC58P	0.07	0.00	0.07	0.00
HOU	AT	Piston	C172	CNA172	CNA172	0.04	0.00	0.04	0.00
HOU	AT	Piston	C182	CNA182	CNA182	0.06	0.00	0.06	0.00
HOU	AT	Piston	C210	GASEPV	GASEPV	1.15	0.18	0.46	0.88
HOU	AT	Piston	C310	BEC58P	BEC58P	0.14	0.00	0.14	0.00
HOU	AT	Piston	C402	BEC58P	BEC58P	0.02	0.58	0.60	0.00
HOU	AT	Piston	PA32	GASEPV	GASEPV	0.06	0.00	0.06	0.00
HOU	AT	Turbo-Prop	BE10	CNA441	CNA441	0.00	0.01	0.01	0.00
HOU	AT	Turbo-Prop	BE20	CNA441	CNA441	0.15	0.07	0.12	0.10
HOU	AT	Turbo-Prop	BE99	CNA441	CNA441	0.04	0.00	0.04	0.00
HOU	AT	Turbo-Prop	BE9L	CNA441	CNA441	0.34	0.00	0.34	0.00
HOU	AT	Turbo-Prop	MU2	CNA441	CNA441	0.04	0.00	0.04	0.00

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	AT	Turbo-Prop	P180	SD330	SD330	1.62	0.00	1.58	0.04
HOU	AT	Turbo-Prop	SW4	DHC6	DHC6	0.09	0.00	0.09	0.00
HOU	GA	Jet	ASTR	IA1125	IA1125	0.53	0.05	0.54	0.04
HOU	GA	Jet	B722	727EM2	727EM2	0.01	0.05	0.06	0.00
HOU	GA	Jet	B737	737700	737700	0.03	0.02	0.05	0.00
HOU	GA	Jet	BE40	MU3001	MU3001	1.11	0.07	1.10	0.08
HOU	GA	Jet	C25A	CNA500	CNA500	0.91	0.09	0.89	0.10
HOU	GA	Jet	C25B	CNA500	CNA500	0.62	0.00	0.62	0.00
HOU	GA	Jet	C25C	CNA500	CNA500	0.37	0.00	0.35	0.02
HOU	GA	Jet	C500	CNA500	CNA500	0.12	0.01	0.12	0.01
HOU	GA	Jet	C501	CNA500	CNA500	0.55	0.02	0.55	0.02
HOU	GA	Jet	C510	CNA510	CNA510	0.66	0.11	0.69	0.08
HOU	GA	Jet	C525	CNA500	CNA500	1.21	0.00	1.12	0.09
HOU	GA	Jet	C550	CNA500	CNA500	0.47	0.02	0.48	0.02
HOU	GA	Jet	C550	CNA55B	CNA55B	0.99	0.07	0.96	0.09
HOU	GA	Jet	C550	MU3001	MU3001	0.41	0.04	0.46	0.00
HOU	GA	Jet	C560	CNA55B	CNA55B	0.15	0.01	0.16	0.00
HOU	GA	Jet	C560	MU3001	MU3001	2.09	0.11	2.10	0.11
HOU	GA	Jet	C56X	CNA55B	CNA55B	1.79	0.08	1.87	0.00
HOU	GA	Jet	C650	CIT3	CIT3	2.04	0.18	2.06	0.16
HOU	GA	Jet	C650	LEAR35	LEAR35	0.03	0.00	0.03	0.00
HOU	GA	Jet	C680	LEAR35	LEAR35	0.37	0.00	0.37	0.00
HOU	GA	Jet	C750	CNA750	CNA750	1.18	0.08	1.18	0.08
HOU	GA	Jet	CL30	CL601	CL601	0.64	0.03	0.62	0.05
HOU	GA	Jet	CL60	CL600	CL600	0.75	0.06	0.71	0.10
HOU	GA	Jet	CL60	CL601	CL601	1.35	0.11	1.38	0.07
HOU	GA	Jet	E135	EMB145	EMB145	0.08	0.00	0.08	0.00
HOU	GA	Jet	E50P	CNA510	CNA510	0.18	0.00	0.18	0.00
HOU	GA	Jet	E55P	CNA55B	CNA55B	0.29	0.00	0.29	0.00
HOU	GA	Jet	EA50	ECLIPSE500	ECLIPSE500	0.21	0.00	0.21	0.00
HOU	GA	Jet	F2TH	CL600	CL600	1.39	0.10	1.49	0.00

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	GA	Jet	F900	F10062	F10062	0.34	0.04	0.36	0.03
HOU	GA	Jet	FA10	LEAR35	LEAR35	0.23	0.04	0.26	0.00
HOU	GA	Jet	FA20	CL600	CL600	0.15	0.00	0.15	0.00
HOU	GA	Jet	FA50	F10062	F10062	0.86	0.05	0.85	0.05
HOU	GA	Jet	FA7X	F10062	F10062	0.04	0.00	0.04	0.00
HOU	GA	Jet	G150	IA1125	IA1125	1.71	0.11	1.77	0.06
HOU	GA	Jet	GALX	CL600	CL600	0.66	0.00	0.60	0.05
HOU	GA	Jet	GLEX	GV	GV	0.11	0.00	0.11	0.00
HOU	GA	Jet	GLF2	GII	GII	0.55	0.00	0.50	0.04
HOU	GA	Jet	GLF2	GIIB	GIIB	0.12	0.00	0.12	0.00
HOU	GA	Jet	GLF3	GIIB	GIIB	0.46	0.00	0.46	0.00
HOU	GA	Jet	GLF4	GIV	GIV	2.81	0.22	2.78	0.26
HOU	GA	Jet	GLF5	GV	GV	0.88	0.10	0.90	0.07
HOU	GA	Jet	H25A	LEAR35	LEAR35	0.24	0.02	0.26	0.00
HOU	GA	Jet	H25B	LEAR35	LEAR35	4.56	0.31	4.34	0.52
HOU	GA	Jet	H25C	LEAR35	LEAR35	0.09	0.00	0.09	0.00
HOU	GA	Jet	HA4T	CL600	CL600	0.21	0.00	0.21	0.00
HOU	GA	Jet	J328	CL600	CL600	0.12	0.00	0.00	0.12
HOU	GA	Jet	LJ25	LEAR25	LEAR25	0.13	0.00	0.13	0.01
HOU	GA	Jet	LJ31	LEAR35	LEAR35	0.67	0.02	0.65	0.04
HOU	GA	Jet	LJ35	LEAR35	LEAR35	0.55	0.00	0.55	0.00
HOU	GA	Jet	LJ40	LEAR35	LEAR35	0.23	0.00	0.23	0.00
HOU	GA	Jet	LJ45	LEAR35	LEAR35	2.80	0.18	2.78	0.20
HOU	GA	Jet	LJ55	LEAR35	LEAR35	0.67	0.09	0.71	0.05
HOU	GA	Jet	LJ60	CNA55B	CNA55B	0.74	0.07	0.76	0.05
HOU	GA	Jet	MU30	MU3001	MU3001	0.13	0.02	0.13	0.03
HOU	GA	Jet	PRM1	LEAR35	LEAR35	0.54	0.00	0.50	0.05
HOU	GA	Jet	SBR1	LEAR35	LEAR35	0.10	0.00	0.10	0.00
HOU	GA	Jet	WW24	IA1125	IA1125	1.30	0.15	1.32	0.13
HOU	GA	Piston	AEST	BEC58P	BEC58P	0.06	0.00	0.06	0.00
HOU	GA	Piston	BE33	GASEPV	GASEPV	0.10	0.00	0.10	0.00

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	GA	Piston	BE35	GASEPV	GASEPV	0.14	0.00	0.14	0.00
HOU	GA	Piston	BE36	GASEPV	GASEPV	0.78	0.00	0.78	0.00
HOU	GA	Piston	BE55	BEC58P	BEC58P	0.21	0.00	0.21	0.00
HOU	GA	Piston	BE58	BEC58P	BEC58P	0.59	0.00	0.59	0.00
HOU	GA	Piston	BE60	BEC58P	BEC58P	0.15	0.00	0.15	0.00
HOU	GA	Piston	C172	CNA172	CNA172	0.24	0.03	0.20	0.06
HOU	GA	Piston	C182	CNA182	CNA182	0.18	0.00	0.18	0.00
HOU	GA	Piston	C206	GASEPV	GASEPV	0.09	0.00	0.09	0.00
HOU	GA	Piston	C210	GASEPV	GASEPV	0.16	0.00	0.16	0.00
HOU	GA	Piston	C310	BEC58P	BEC58P	0.12	0.00	0.12	0.00
HOU	GA	Piston	C340	BEC58P	BEC58P	0.14	0.00	0.14	0.00
HOU	GA	Piston	C414	BEC58P	BEC58P	0.19	0.01	0.18	0.02
HOU	GA	Piston	C421	BEC58P	BEC58P	0.50	0.04	0.43	0.10
HOU	GA	Piston	DA40	GASEPV	GASEPV	0.02	0.00	0.02	0.00
HOU	GA	Piston	LEG2	GASEPV	GASEPV	0.08	0.00	0.08	0.00
HOU	GA	Piston	M20P	GASEPV	GASEPV	0.26	0.00	0.22	0.05
HOU	GA	Piston	M20T	GASEPV	GASEPV	0.06	0.00	0.06	0.00
HOU	GA	Piston	P28A	BEC58P	BEC58P	0.06	0.00	0.06	0.00
HOU	GA	Piston	PA24	GASEPV	GASEPV	0.03	0.00	0.03	0.00
HOU	GA	Piston	PA31	BEC58P	BEC58P	0.23	0.00	0.23	0.00
HOU	GA	Piston	PA32	GASEPV	GASEPV	0.10	0.00	0.10	0.00
HOU	GA	Piston	PA34	BEC58P	BEC58P	0.16	0.03	0.19	0.00
HOU	GA	Piston	PA46	GASEPV	GASEPV	0.23	0.00	0.23	0.00
HOU	GA	Piston	SR20	GASEPV	GASEPV	0.11	0.00	0.11	0.00
HOU	GA	Piston	SR22	GASEPV	GASEPV	0.70	0.00	0.70	0.00
HOU	GA	Turbo-Prop	AC90	CNA441	CNA441	0.13	0.00	0.13	0.00
HOU	GA	Turbo-Prop	AC95	CNA441	CNA441	0.02	0.00	0.02	0.00
HOU	GA	Turbo-Prop	B350	DO228	DO228	3.02	0.21	3.04	0.19
HOU	GA	Turbo-Prop	B350	LEAR35	LEAR35	0.00	0.02	0.02	0.00
HOU	GA	Turbo-Prop	BE10	CNA441	CNA441	0.17	0.00	0.17	0.00
HOU	GA	Turbo-Prop	BE20	CNA441	CNA441	3.60	0.23	3.61	0.22

IAH/HOU NIRS Type Operations Tables for 2014

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	GA	Turbo-Prop	BE30	DO228	DO228	0.61	0.03	0.64	0.00
HOU	GA	Turbo-Prop	BE9L	CNA441	CNA441	1.43	0.04	1.35	0.11
HOU	GA	Turbo-Prop	BE9T	CNA441	CNA441	0.25	0.02	0.27	0.00
HOU	GA	Turbo-Prop	C208	CNA208	CNA208	0.16	0.00	0.16	0.00
HOU	GA	Turbo-Prop	C425	CNA441	CNA441	0.10	0.00	0.10	0.00
HOU	GA	Turbo-Prop	C441	CNA441	CNA441	0.13	0.01	0.12	0.01
HOU	GA	Turbo-Prop	MU2	CNA441	CNA441	0.55	0.00	0.49	0.06
HOU	GA	Turbo-Prop	P46T	CNA208	CNA208	0.23	0.00	0.23	0.00
HOU	GA	Turbo-Prop	PAY1	CNA441	CNA441	0.19	0.00	0.17	0.02
HOU	GA	Turbo-Prop	PAY2	CNA441	CNA441	0.26	0.00	0.24	0.02
HOU	GA	Turbo-Prop	PC12	CNA208	CNA208	1.73	0.12	1.73	0.12
HOU	GA	Turbo-Prop	SW3	CNA441	CNA441	0.13	0.00	0.13	0.00
HOU	GA	Turbo-Prop	TBM7	CNA208	CNA208	0.21	0.00	0.19	0.01
HOU	GA	Turbo-Prop	TBM8	CNA208	CNA208	0.11	0.01	0.12	0.00
IAH	AC	Jet	A306	A300-622R	A300-622R	0.45	1.54	0.64	1.36
IAH	AC	Jet	A319	A319-131	A319-131	4.04	0.45	3.86	0.64
IAH	AC	Jet	A320	A320-211	A320-211	0.25	0.13	0.28	0.10
IAH	AC	Jet	A320	A320-232	A320-232	2.09	0.96	2.67	0.38
IAH	AC	Jet	B722	727EM2	727EM2	0.00	0.03	0.00	0.03
IAH	AC	Jet	B733	7373B2	7373B2	1.98	1.08	2.26	0.80
IAH	AC	Jet	B734	737400	737400	5.06	0.90	5.34	0.63
IAH	AC	Jet	B735	737500	737500	33.28	2.15	34.97	0.46
IAH	AC	Jet	B737	737700	737700	37.07	3.13	37.93	2.26
IAH	AC	Jet	B738	737700	737800	123.66	14.12	132.75	5.06
IAH	AC	Jet	B739	737700	737800	48.10	5.56	52.37	1.24
IAH	AC	Jet	B742	74720A	74720A	0.04	0.00	0.00	0.04
IAH	AC	Jet	B742	74720B	74720B	0.00	0.02	0.02	0.00
IAH	AC	Jet	B744	747400	747400	2.42	1.52	2.75	1.20
IAH	AC	Jet	B752	757PW	757PW	1.29	0.69	1.47	0.51
IAH	AC	Jet	B752	757RR	757RR	10.76	1.50	11.60	0.66
IAH	AC	Jet	B753	757RR	757300	17.24	2.36	18.94	0.66

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IAH	AC	Jet	B762	767CF6	767CF6	2.20	1.88	3.38	0.70
IAH	AC	Jet	B762	767JT9	767JT9	0.22	0.17	0.16	0.24
IAH	AC	Jet	B763	767300	767300	1.45	1.08	2.28	0.25
IAH	AC	Jet	B764	A330-343	767400	4.99	2.10	6.86	0.24
IAH	AC	Jet	B772	A310-304	777200	6.94	0.30	7.07	0.18
IAH	AC	Jet	B77L	A310-304	777300	0.00	0.00	0.54	0.00
IAH	AC	Jet	B77W	A310-304	777300	2.59	0.00	2.05	0.00
IAH	AC	Jet	CRJ7	CRJ9-ER	CRJ9-ER	38.56	4.15	40.42	2.29
IAH	AC	Jet	CRJ9	CRJ9-ER	CRJ9-ER	9.96	1.77	11.01	0.72
IAH	AC	Jet	CRJ9	CRJ9-LR	CRJ9-LR	5.59	0.43	5.88	0.14
IAH	AC	Jet	DC10	DC1010	DC1010	0.17	0.85	0.21	0.81
IAH	AC	Jet	DC10	DC1030	DC1030	0.05	0.19	0.06	0.18
IAH	AC	Jet	DC87	DC870	DC870	0.73	0.31	0.59	0.46
IAH	AC	Jet	DC95	DC95HW	DC95HW	0.85	0.11	0.96	0.00
IAH	AC	Jet	E170	737500	737500	7.16	0.31	6.50	0.98
IAH	AC	Jet	E190	A319-131	A319-131	1.04	0.00	0.76	0.28
IAH	AC	Jet	MD11	727D17	MD11GE	0.35	0.20	0.02	0.53
IAH	AC	Jet	MD11	727D17	MD11PW	0.24	0.13	0.00	0.37
IAH	AC	Jet	MD82	MD9025	MD82	4.09	0.15	4.24	0.00
IAH	AC	Jet	MD83	MD9025	MD83	1.60	0.06	1.61	0.06
IAH	AC	Jet	MD88	MD9025	MD83	2.56	0.53	2.58	0.50
IAH	AC	Jet	MD90	MD9028	MD9028	0.19	0.00	0.19	0.00
IAH	AC	High-Performance Turbo-Prop	DH8D	DHC830	DHC830	18.80	0.88	18.79	0.89
IAH	AT	Jet	BE40	MU3001	MU3001	0.10	0.00	0.10	0.00
IAH	AT	Jet	C560	MU3001	MU3001	0.43	0.00	0.43	0.00
IAH	AT	Jet	C680	LEAR35	LEAR35	0.34	0.01	0.35	0.00
IAH	AT	Jet	C750	CNA750	CNA750	0.37	0.02	0.38	0.00
IAH	AT	Jet	CRJ2	CL601	CL601	9.54	0.60	9.08	1.06
IAH	AT	Jet	E135	EMB145	EMB145	0.06	0.00	0.07	0.00
IAH	AT	Jet	E145	EMB145	EMB145	36.22	1.30	37.02	0.49

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IAH	AT	Jet	E145	EMB145	EMB14L	152.85	6.09	156.66	2.27
IAH	AT	Jet	E45X	EMB145	EMB14L	107.17	3.28	108.61	1.83
IAH	AT	Jet	F2TH	CL600	CL600	0.17	0.00	0.15	0.02
IAH	AT	Jet	GALX	CL600	CL600	0.07	0.00	0.07	0.00
IAH	AT	Jet	H25B	LEAR35	LEAR35	0.22	0.00	0.22	0.00
IAH	AT	Turbo-Prop	SF34	SF340	SF340	43.07	2.77	43.86	1.97
IAH	AT	Turbo-Prop	SH36	SD330	SD330	0.74	0.01	0.75	0.00
IAH	AT	Turbo-Prop	SW4	DHC6	DHC6	0.69	0.03	0.72	0.00
IAH	GA	Jet	BE40	MU3001	MU3001	0.28	0.00	0.28	0.00
IAH	GA	Jet	C25A	CNA500	CNA500	0.09	0.00	0.09	0.00
IAH	GA	Jet	C25B	CNA500	CNA500	0.03	0.00	0.03	0.00
IAH	GA	Jet	C500	CNA500	CNA500	0.05	0.00	0.05	0.00
IAH	GA	Jet	C525	CNA500	CNA500	0.19	0.00	0.19	0.00
IAH	GA	Jet	C550	CNA500	CNA500	0.07	0.00	0.07	0.00
IAH	GA	Jet	C550	CNA55B	CNA55B	0.08	0.00	0.08	0.00
IAH	GA	Jet	C550	MU3001	MU3001	0.18	0.00	0.18	0.00
IAH	GA	Jet	C560	MU3001	MU3001	1.35	0.00	1.25	0.11
IAH	GA	Jet	C650	CIT3	CIT3	0.19	0.03	0.22	0.00
IAH	GA	Jet	C680	LEAR35	LEAR35	0.83	0.00	0.77	0.07
IAH	GA	Jet	CL30	CL601	CL601	1.35	0.05	1.25	0.14
IAH	GA	Jet	CL60	CL600	CL600	0.04	0.00	0.04	0.00
IAH	GA	Jet	CL60	CL601	CL601	0.17	0.00	0.17	0.00
IAH	GA	Jet	E135	EMB145	EMB145	0.00	0.04	0.04	0.00
IAH	GA	Jet	F2TH	CL600	CL600	0.50	0.00	0.00	0.50
IAH	GA	Jet	F900	F10062	F10062	0.50	0.03	0.49	0.03
IAH	GA	Jet	FA20	CL600	CL600	0.08	0.00	0.08	0.00
IAH	GA	Jet	FA50	F10062	F10062	0.43	0.00	0.43	0.00
IAH	GA	Jet	GALX	CL600	CL600	0.05	0.00	0.05	0.00
IAH	GA	Jet	GLEX	GV	GV	0.27	0.02	0.24	0.06
IAH	GA	Jet	GLF4	GIV	GIV	1.28	0.11	1.29	0.10
IAH	GA	Jet	GLF5	GV	GV	1.48	0.17	1.53	0.13

IAH/HOU NIRS Type Operations Tables for 2014

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IAH	GA	Jet	H25A	LEAR35	LEAR35	0.02	0.00	0.02	0.00
IAH	GA	Jet	H25B	LEAR35	LEAR35	1.08	0.00	1.01	0.06
IAH	GA	Jet	LJ31	LEAR35	LEAR35	0.07	0.00	0.07	0.00
IAH	GA	Jet	LJ35	LEAR35	LEAR35	0.11	0.00	0.11	0.00
IAH	GA	Jet	LJ45	LEAR35	LEAR35	0.70	0.00	0.64	0.07
IAH	GA	Jet	WW24	IA1125	IA1125	0.13	0.00	0.13	0.00
IAH	GA	Piston	BE58	BEC58P	BEC58P	0.18	0.00	0.18	0.00
IAH	GA	Piston	C310	BEC58P	BEC58P	0.17	0.00	0.17	0.00
IAH	GA	Piston	C421	BEC58P	BEC58P	0.30	0.00	0.30	0.00
IAH	GA	Piston	PA32	GASEPV	GASEPV	0.39	0.00	0.39	0.00
IAH	GA	Piston	PA46	GASEPV	GASEPV	0.16	0.00	0.16	0.00
IAH	GA	Piston	SR22	GASEPV	GASEPV	0.39	0.00	0.39	0.00
IAH	GA	Turbo-Prop	B350	DO228	DO228	0.31	0.01	0.31	0.00
IAH	GA	Turbo-Prop	BE10	CNA441	CNA441	0.04	0.00	0.04	0.00
IAH	GA	Turbo-Prop	BE20	CNA441	CNA441	0.66	0.00	0.66	0.00
IAH	GA	Turbo-Prop	BE30	DO228	DO228	0.11	0.00	0.11	0.00
IAH	GA	Turbo-Prop	BE9L	CNA441	CNA441	0.17	0.00	0.17	0.00
IAH	GA	Turbo-Prop	P180	SD330	SD330	0.05	0.00	0.05	0.00

Satellite 2014 Operations								
Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
DWH	Jet	BE40	MU3001	MU3001	1.28	0.05	1.29	0.04
DWH	Jet	C25A	CNA500	CNA500	0.10	0.00	0.10	0.00
DWH	Jet	C25B	CNA500	CNA500	0.17	0.00	0.17	0.00
DWH	Jet	C500	CNA500	CNA500	0.08	0.00	0.08	0.00
DWH	Jet	C501	CNA500	CNA500	0.13	0.00	0.13	0.00
DWH	Jet	C510	CNA510	CNA510	0.49	0.05	0.54	0.00
DWH	Jet	C525	CNA500	CNA500	0.23	0.01	0.24	0.00
DWH	Jet	C550	CNA500	CNA500	0.12	0.00	0.12	0.00
DWH	Jet	C550	CNA55B	CNA55B	0.22	0.02	0.24	0.00
DWH	Jet	C550	MU3001	MU3001	0.15	0.01	0.00	0.16
DWH	Jet	C560	MU3001	MU3001	0.65	0.08	0.69	0.04
DWH	Jet	C56X	CNA55B	CNA55B	1.37	0.00	1.37	0.00
DWH	Jet	C650	CIT3	CIT3	0.31	0.00	0.31	0.00
DWH	Jet	C680	LEAR35	LEAR35	0.41	0.00	0.41	0.00
DWH	Jet	C750	CNA750	CNA750	0.33	0.00	0.33	0.00
DWH	Jet	CL30	CL601	CL601	0.13	0.00	0.13	0.00
DWH	Jet	CL60	CL601	CL601	0.18	0.01	0.19	0.00
DWH	Jet	E135	EMB145	EMB145	0.02	0.00	0.02	0.00
DWH	Jet	E55P	CNA55B	CNA55B	0.02	0.00	0.02	0.00
DWH	Jet	EA50	ECLIPSE500	ECLIPSE500	0.06	0.00	0.06	0.00
DWH	Jet	F2TH	CL600	CL600	0.15	0.00	0.15	0.00
DWH	Jet	FA20	CL600	CL600	0.25	0.00	0.25	0.00
DWH	Jet	FA50	F10062	F10062	0.10	0.00	0.10	0.00
DWH	Jet	GALX	CL600	CL600	0.11	0.00	0.11	0.00
DWH	Jet	GLF4	GIV	GIV	0.48	0.11	0.59	0.00
DWH	Jet	H25B	LEAR35	LEAR35	0.42	0.00	0.42	0.00
DWH	Jet	LJ31	LEAR35	LEAR35	0.08	0.00	0.08	0.00
DWH	Jet	LJ35	LEAR35	LEAR35	0.08	0.00	0.08	0.00
DWH	Jet	LJ45	LEAR35	LEAR35	0.16	0.00	0.16	0.00
DWH	Jet	LJ55	LEAR35	LEAR35	0.03	0.00	0.03	0.00
DWH	Jet	LJ60	CNA55B	CNA55B	0.38	0.00	0.35	0.03

Satellite Airport NIRS Type Operations Tables for 2014

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
DWH	Jet	PRM1	LEAR35	LEAR35	0.08	0.00	0.08	0.00
DWH	Jet	SBR1	LEAR35	LEAR35	0.37	0.00	0.30	0.07
DWH	Jet	WW24	IA1125	IA1125	0.16	0.00	0.15	0.01
DWH	Piston	AA5	GASEPF	GASEPF	0.06	0.00	0.06	0.00
DWH	Piston	AC11	GASEPV	GASEPV	0.05	0.00	0.05	0.00
DWH	Piston	AEST	BEC58P	BEC58P	0.06	0.00	0.06	0.00
DWH	Piston	B36T	GASEPV	GASEPV	0.01	0.00	0.01	0.00
DWH	Piston	BE33	GASEPV	GASEPV	0.26	0.00	0.26	0.00
DWH	Piston	BE35	GASEPV	GASEPV	0.40	0.00	0.40	0.00
DWH	Piston	BE36	GASEPV	GASEPV	1.05	0.00	1.05	0.00
DWH	Piston	BE55	BEC58P	BEC58P	0.46	0.00	0.46	0.00
DWH	Piston	BE58	BEC58P	BEC58P	0.38	0.00	0.38	0.00
DWH	Piston	BL17	GASEPV	GASEPV	0.03	0.00	0.03	0.00
DWH	Piston	C172	CNA172	CNA172	3.62	0.15	3.76	0.00
DWH	Piston	C177	CNA172	CNA172	0.05	0.00	0.05	0.00
DWH	Piston	C182	CNA182	CNA182	1.23	0.04	1.28	0.00
DWH	Piston	C206	GASEPV	GASEPV	0.25	0.00	0.25	0.00
DWH	Piston	C210	GASEPV	GASEPV	0.65	0.00	0.65	0.00
DWH	Piston	C310	BEC58P	BEC58P	0.29	0.00	0.25	0.04
DWH	Piston	C340	BEC58P	BEC58P	0.07	0.00	0.07	0.00
DWH	Piston	C402	BEC58P	BEC58P	0.13	0.00	0.13	0.00
DWH	Piston	C414	BEC58P	BEC58P	0.28	0.00	0.28	0.00
DWH	Piston	C421	BEC58P	BEC58P	0.52	0.00	0.52	0.00
DWH	Piston	C72R	CNA172	CNA172	0.09	0.00	0.09	0.00
DWH	Piston	C82R	CNA182	CNA182	0.06	0.00	0.06	0.00
DWH	Piston	COL3	GASEPV	GASEPV	0.21	0.00	0.21	0.00
DWH	Piston	COL4	GASEPV	GASEPV	0.21	0.00	0.21	0.00
DWH	Piston	M200	GASEPV	GASEPV	0.03	0.00	0.03	0.00
DWH	Piston	M20P	GASEPV	GASEPV	0.50	0.00	0.50	0.00
DWH	Piston	P28A	BEC58P	BEC58P	0.43	0.00	0.43	0.00
DWH	Piston	P28R	GASEPV	GASEPV	0.10	0.00	0.10	0.00

Satellite Airport NIRS Type Operations Tables for 2014

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
DWH	Piston	P32R	GASEPV	GASEPV	0.16	0.00	0.16	0.00
DWH	Piston	P32T	GASEPV	GASEPV	0.10	0.00	0.10	0.00
DWH	Piston	PA24	GASEPV	GASEPV	0.11	0.00	0.11	0.00
DWH	Piston	PA32	GASEPV	GASEPV	0.35	0.00	0.35	0.00
DWH	Piston	PA34	BEC58P	BEC58P	0.12	0.00	0.12	0.00
DWH	Piston	PA44	BEC58P	BEC58P	0.90	0.10	1.00	0.00
DWH	Piston	PA46	GASEPV	GASEPV	0.23	0.00	0.23	0.00
DWH	Piston	SR20	GASEPV	GASEPV	0.05	0.00	0.05	0.00
DWH	Piston	SR22	GASEPV	GASEPV	1.10	0.08	1.09	0.10
DWH	Piston	T34T	GASEPV	GASEPV	0.36	0.00	0.36	0.00
DWH	Piston	TEX2	GASEPV	GASEPV	0.37	0.00	0.37	0.00
DWH	Turbo-Prop	AC90	CNA441	CNA441	0.05	0.00	0.05	0.00
DWH	Turbo-Prop	B350	DO228	DO228	0.34	0.01	0.35	0.00
DWH	Turbo-Prop	BE10	CNA441	CNA441	0.04	0.00	0.04	0.00
DWH	Turbo-Prop	BE20	CNA441	CNA441	1.36	0.13	1.49	0.00
DWH	Turbo-Prop	BE30	DO228	DO228	0.30	0.00	0.30	0.00
DWH	Turbo-Prop	BE9L	CNA441	CNA441	0.61	0.00	0.61	0.00
DWH	Turbo-Prop	BE9T	CNA441	CNA441	0.01	0.00	0.01	0.00
DWH	Turbo-Prop	C425	CNA441	CNA441	0.04	0.00	0.04	0.00
DWH	Turbo-Prop	C441	CNA441	CNA441	0.05	0.00	0.05	0.00
DWH	Turbo-Prop	P180	SD330	SD330	0.32	0.00	0.32	0.00
DWH	Turbo-Prop	P46T	CNA208	CNA208	0.47	0.04	0.49	0.03
DWH	Turbo-Prop	PC12	CNA208	CNA208	1.37	0.13	1.34	0.15
DWH	Turbo-Prop	SW3	CNA441	CNA441	0.17	0.00	0.16	0.01
DWH	Turbo-Prop	TBM7	CNA208	CNA208	0.21	0.00	0.20	0.00
DWH	Turbo-Prop	TBM8	CNA208	CNA208	0.27	0.00	0.27	0.00
EFD	Jet	B722	727EM2	727EM2	0.19	0.00	0.19	0.00
EFD	Jet	BE40	MU3001	MU3001	0.93	0.40	1.33	0.00
EFD	Jet	C25A	CNA500	CNA500	0.11	0.00	0.11	0.00
EFD	Jet	C25B	CNA500	CNA500	0.31	0.00	0.31	0.00
EFD	Jet	C500	CNA500	CNA500	0.00	0.00	0.00	0.00

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
EFD	Jet	C501	CNA500	CNA500	0.04	0.00	0.04	0.00
EFD	Jet	C525	CNA500	CNA500	0.09	0.00	0.09	0.00
EFD	Jet	C550	MU3001	MU3001	0.30	0.00	0.30	0.00
EFD	Jet	C560	MU3001	MU3001	0.56	0.00	0.56	0.00
EFD	Jet	C56X	CNA55B	CNA55B	0.24	0.00	0.24	0.00
EFD	Jet	C650	CIT3	CIT3	0.23	0.00	0.23	0.00
EFD	Jet	C680	LEAR35	LEAR35	0.13	0.00	0.13	0.00
EFD	Jet	C750	CNA750	CNA750	0.09	0.00	0.09	0.00
EFD	Jet	CL60	CL601	CL601	0.12	0.00	0.12	0.00
EFD	Jet	E135	EMB145	EMB145	0.06	0.00	0.06	0.00
EFD	Jet	E6	DC870	DC870	0.02	0.00	0.02	0.00
EFD	Jet	EA50	ECLIPSE500	ECLIPSE500	0.18	0.01	0.19	0.00
EFD	Jet	F16	LEAR25	LEAR25	0.75	0.00	0.75	0.00
EFD	Jet	F18	A7D	LEAR25	0.42	0.00	0.42	0.00
EFD	Jet	FA18	A7D	LEAR25	0.02	0.00	0.02	0.00
EFD	Jet	FA20	CL600	CL600	0.22	0.00	0.22	0.00
EFD	Jet	G150	IA1125	IA1125	1.17	0.03	1.20	0.00
EFD	Jet	GL5T	GV	GV	0.00	0.00	0.00	0.00
EFD	Jet	GLF2	GIIB	GIIB	0.42	0.00	0.42	0.00
EFD	Jet	GLF4	GIV	GIV	0.19	0.00	0.19	0.00
EFD	Jet	H25B	LEAR35	LEAR35	0.62	0.03	0.61	0.04
EFD	Jet	HAWK	A7D	A7D	0.94	0.00	0.94	0.00
EFD	Jet	LJ35	LEAR35	LEAR35	0.04	0.00	0.04	0.00
EFD	Jet	LJ60	CNA55B	CNA55B	0.40	0.00	0.40	0.00
EFD	Jet	MD82	MD9025	MD82	0.00	0.00	0.00	0.00
EFD	Jet	MD83	MD9025	MD83	0.21	0.00	0.21	0.00
EFD	Jet	SBR1	LEAR35	LEAR35	0.05	0.00	0.04	0.00
EFD	Jet	T38	LEAR25	LEAR25	8.76	0.21	8.97	0.00
EFD	Piston	BE35	GASEPV	GASEPV	0.18	0.00	0.18	0.00
EFD	Piston	BE36	GASEPV	GASEPV	0.38	0.00	0.38	0.00
EFD	Piston	BE55	BEC58P	BEC58P	0.13	0.00	0.13	0.00

Satellite Airport NIRS Type Operations Tables for 2014

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
EFD	Piston	BE58	BEC58P	BEC58P	0.41	0.07	0.48	0.00
EFD	Piston	C177	CNA172	CNA172	0.03	0.00	0.03	0.00
EFD	Piston	C182	CNA182	CNA182	0.46	0.00	0.41	0.04
EFD	Piston	C210	GASEPV	GASEPV	0.42	0.00	0.30	0.12
EFD	Piston	C340	BEC58P	BEC58P	0.15	0.00	0.15	0.00
EFD	Piston	C402	BEC58P	BEC58P	0.01	0.00	0.01	0.00
EFD	Piston	C414	BEC58P	BEC58P	0.26	0.00	0.26	0.00
EFD	Piston	C421	BEC58P	BEC58P	1.01	0.00	1.01	0.00
EFD	Piston	COL4	GASEPV	GASEPV	0.21	0.00	0.21	0.00
EFD	Piston	DA40	GASEPV	GASEPV	0.16	0.01	0.18	0.00
EFD	Piston	DA42	BEC58P	BEC58P	0.01	0.00	0.01	0.00
EFD	Piston	M20P	GASEPV	GASEPV	0.46	0.00	0.44	0.02
EFD	Piston	P28A	BEC58P	BEC58P	0.16	0.00	0.16	0.00
EFD	Piston	P28R	GASEPV	GASEPV	0.19	0.00	0.17	0.02
EFD	Piston	P32R	GASEPV	GASEPV	0.13	0.00	0.13	0.00
EFD	Piston	P32T	GASEPV	GASEPV	0.04	0.00	0.04	0.00
EFD	Piston	PA31	BEC58P	BEC58P	0.24	0.00	0.24	0.00
EFD	Piston	PA32	GASEPV	GASEPV	0.31	0.00	0.30	0.01
EFD	Piston	PA44	BEC58P	BEC58P	0.33	0.00	0.33	0.00
EFD	Piston	PA46	GASEPV	GASEPV	0.20	0.00	0.20	0.00
EFD	Piston	SR20	GASEPV	GASEPV	1.16	0.00	1.16	0.00
EFD	Piston	SR22	GASEPV	GASEPV	1.01	0.00	1.01	0.00
EFD	Piston	T18	GASEPV	GASEPV	0.04	0.00	0.04	0.00
EFD	Piston	T34T	GASEPV	GASEPV	0.36	0.00	0.36	0.00
EFD	Turbo-Prop	BE20	CNA441	CNA441	0.63	0.00	0.63	0.00
EFD	Turbo-Prop	BE9L	CNA441	CNA441	0.71	0.00	0.65	0.06
EFD	Turbo-Prop	C130	C130	C130	0.35	0.00	0.35	0.00
EFD	Turbo-Prop	C441	CNA441	CNA441	0.11	0.00	0.11	0.00
EFD	Turbo-Prop	MU2	CNA441	CNA441	0.16	0.00	0.16	0.00
EFD	Turbo-Prop	P46T	CNA208	CNA208	0.20	0.00	0.20	0.00
EFD	Turbo-Prop	PC12	CNA208	CNA208	0.25	0.02	0.26	0.01

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
EFD	Turbo-Prop	TBM7	CNA208	CNA208	0.10	0.00	0.10	0.00
IWS	Jet	C25C	CNA500	CNA500	0.24	0.00	0.24	0.00
IWS	Jet	C501	CNA500	CNA500	0.09	0.00	0.09	0.00
IWS	Jet	C510	CNA510	CNA510	0.90	0.00	0.90	0.00
IWS	Jet	C525	CNA500	CNA500	0.19	0.01	0.19	0.01
IWS	Jet	C550	MU3001	MU3001	0.26	0.00	0.26	0.00
IWS	Jet	LJ40	LEAR35	LEAR35	0.03	0.00	0.03	0.00
IWS	Piston	BE33	GASEPV	GASEPV	0.41	0.00	0.39	0.02
IWS	Piston	BE35	GASEPV	GASEPV	0.70	0.00	0.70	0.00
IWS	Piston	BE36	GASEPV	GASEPV	1.31	0.00	1.31	0.00
IWS	Piston	BE55	BEC58P	BEC58P	0.71	0.00	0.68	0.03
IWS	Piston	BE58	BEC58P	BEC58P	1.54	0.00	1.54	0.00
IWS	Piston	BE60	BEC58P	BEC58P	0.00	0.26	0.26	0.00
IWS	Piston	C172	CNA172	CNA172	0.72	0.00	0.72	0.00
IWS	Piston	C182	CNA182	CNA182	1.23	0.00	1.15	0.09
IWS	Piston	C206	GASEPV	GASEPV	0.27	0.00	0.27	0.00
IWS	Piston	C320	BEC58P	BEC58P	0.00	0.00	0.00	0.00
IWS	Piston	C340	BEC58P	BEC58P	0.21	0.00	0.21	0.00
IWS	Piston	C414	BEC58P	BEC58P	0.14	0.00	0.14	0.00
IWS	Piston	C421	BEC58P	BEC58P	0.69	0.00	0.67	0.02
IWS	Piston	COL3	GASEPV	GASEPV	0.07	0.00	0.07	0.00
IWS	Piston	DA40	GASEPV	GASEPV	0.13	0.00	0.13	0.00
IWS	Piston	M20P	GASEPV	GASEPV	0.30	0.02	0.32	0.00
IWS	Piston	P28B	BEC58P	BEC58P	0.12	0.00	0.12	0.00
IWS	Piston	P28R	GASEPV	GASEPV	0.07	0.00	0.07	0.00
IWS	Piston	P32R	GASEPV	GASEPV	0.33	0.00	0.32	0.01
IWS	Piston	P32T	GASEPV	GASEPV	0.07	0.00	0.07	0.00
IWS	Piston	PA24	GASEPV	GASEPV	0.27	0.00	0.27	0.00
IWS	Piston	PA31	BEC58P	BEC58P	0.11	0.00	0.11	0.00
IWS	Piston	PA32	GASEPV	GASEPV	0.56	0.00	0.56	0.00
IWS	Piston	PA46	GASEPV	GASEPV	1.10	0.00	1.03	0.07

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IWS	Piston	SR22	GASEPV	GASEPV	0.79	0.01	0.77	0.02
IWS	Turbo-Prop	B350	DO228	DO228	0.21	0.00	0.21	0.00
IWS	Turbo-Prop	BE20	CNA441	CNA441	1.52	0.02	1.49	0.05
IWS	Turbo-Prop	BE9L	CNA441	CNA441	0.51	0.00	0.47	0.05
IWS	Turbo-Prop	BE9T	CNA441	CNA441	0.04	0.00	0.04	0.00
IWS	Turbo-Prop	C208	CNA208	CNA208	0.29	0.00	0.29	0.00
IWS	Turbo-Prop	C425	CNA441	CNA441	0.44	0.00	0.43	0.01
IWS	Turbo-Prop	C441	CNA441	CNA441	0.25	0.00	0.25	0.00
IWS	Turbo-Prop	P46T	CNA208	CNA208	0.53	0.00	0.53	0.00
IWS	Turbo-Prop	PC12	CNA208	CNA208	1.76	0.00	1.76	0.00
IWS	Turbo-Prop	SW3	CNA441	CNA441	0.04	0.00	0.04	0.00
LBX	Jet	C25B	CNA500	CNA500	0.00	0.02	0.02	0.00
LBX	Jet	C525	CNA500	CNA500	0.11	0.00	0.11	0.00
LBX	Jet	C560	MU3001	MU3001	0.07	0.00	0.07	0.00
LBX	Jet	CRJ7	CRJ9-ER	CRJ9-ER	3.62	0.00	3.62	0.00
LBX	Jet	F2TH	CL600	CL600	0.09	0.00	0.09	0.00
LBX	Jet	H25B	LEAR35	LEAR35	0.08	0.02	0.10	0.00
LBX	Jet	LJ55	LEAR35	LEAR35	0.00	0.01	0.00	0.01
LBX	Piston	BE35	GASEPV	GASEPV	0.14	0.00	0.14	0.00
LBX	Piston	C172	CNA172	CNA172	0.50	0.00	0.50	0.00
LBX	Piston	C182	CNA182	CNA182	0.27	0.00	0.27	0.00
LBX	Piston	C210	GASEPV	GASEPV	1.86	0.00	0.46	1.40
LBX	Piston	PA24	GASEPV	GASEPV	0.57	0.00	0.17	0.40
SGR	Jet	BE40	MU3001	MU3001	0.74	0.00	0.74	0.00
SGR	Jet	C25A	CNA500	CNA500	0.37	0.00	0.37	0.00
SGR	Jet	C25B	CNA500	CNA500	0.75	0.02	0.73	0.04
SGR	Jet	C501	CNA500	CNA500	0.42	0.00	0.41	0.02
SGR	Jet	C525	CNA500	CNA500	0.73	0.00	0.73	0.00
SGR	Jet	C550	CNA55B	CNA55B	0.27	0.00	0.27	0.00
SGR	Jet	C550	MU3001	MU3001	0.32	0.00	0.32	0.00
SGR	Jet	C560	MU3001	MU3001	1.07	0.03	1.06	0.04

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
SGR	Jet	C56X	CNA55B	CNA55B	1.75	0.06	1.75	0.05
SGR	Jet	C650	CIT3	CIT3	2.08	0.10	1.62	0.55
SGR	Jet	C680	LEAR35	LEAR35	0.93	0.00	0.93	0.00
SGR	Jet	C750	CNA750	CNA750	1.14	0.06	1.14	0.06
SGR	Jet	CL30	CL601	CL601	0.44	0.00	0.41	0.03
SGR	Jet	CL60	CL600	CL600	0.20	0.00	0.17	0.02
SGR	Jet	CL60	CL601	CL601	0.33	0.03	0.36	0.00
SGR	Jet	E135	EMB145	EMB145	0.09	0.01	0.10	0.00
SGR	Jet	E50P	CNA510	CNA510	0.50	0.60	0.00	1.10
SGR	Jet	E55P	CNA55B	CNA55B	0.13	0.00	0.13	0.00
SGR	Jet	EA50	ECLIPSE500	ECLIPSE500	0.17	0.00	0.17	0.00
SGR	Jet	F2TH	CL600	CL600	0.97	0.06	1.03	0.00
SGR	Jet	F900	F10062	F10062	0.26	0.00	0.26	0.00
SGR	Jet	FA10	LEAR35	LEAR35	0.05	0.00	0.05	0.00
SGR	Jet	FA20	CL600	CL600	0.18	0.00	0.18	0.00
SGR	Jet	FA50	F10062	F10062	0.20	0.00	0.20	0.00
SGR	Jet	GALX	CL600	CL600	0.45	0.00	0.45	0.00
SGR	Jet	GLEX	GV	GV	0.05	0.00	0.05	0.00
SGR	Jet	GLF4	GIV	GIV	0.78	0.00	0.78	0.00
SGR	Jet	GLF5	GV	GV	0.19	0.00	0.19	0.00
SGR	Jet	H25A	LEAR35	LEAR35	0.01	0.00	0.01	0.00
SGR	Jet	H25B	LEAR35	LEAR35	0.82	0.00	0.82	0.00
SGR	Jet	H25C	LEAR35	LEAR35	0.00	0.00	0.00	0.00
SGR	Jet	LJ35	LEAR35	LEAR35	0.20	0.00	0.20	0.00
SGR	Jet	LJ40	LEAR35	LEAR35	0.37	0.00	0.37	0.00
SGR	Jet	LJ45	LEAR35	LEAR35	0.64	0.05	0.65	0.04
SGR	Jet	LJ55	LEAR35	LEAR35	0.09	0.00	0.09	0.00
SGR	Jet	LJ60	CNA55B	CNA55B	1.04	0.07	0.96	0.14
SGR	Jet	PRM1	LEAR35	LEAR35	0.22	0.00	0.21	0.00
SGR	Jet	WW24	IA1125	IA1125	0.19	0.04	0.23	0.00
SGR	Piston	AC50	BEC58P	BEC58P	0.87	0.00	0.87	0.00

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
SGR	Piston	AEST	BEC58P	BEC58P	0.13	0.00	0.13	0.00
SGR	Piston	BE33	GASEPV	GASEPV	0.07	0.00	0.07	0.00
SGR	Piston	BE35	GASEPV	GASEPV	0.34	0.00	0.34	0.00
SGR	Piston	BE36	GASEPV	GASEPV	0.42	0.00	0.41	0.01
SGR	Piston	BE55	BEC58P	BEC58P	0.29	0.00	0.29	0.00
SGR	Piston	BE58	BEC58P	BEC58P	0.30	0.00	0.30	0.00
SGR	Piston	BE60	BEC58P	BEC58P	0.13	0.00	0.13	0.00
SGR	Piston	C172	CNA172	CNA172	1.26	0.05	1.24	0.06
SGR	Piston	C182	CNA182	CNA182	0.70	0.00	0.70	0.00
SGR	Piston	C206	GASEPV	GASEPV	0.24	0.00	0.24	0.00
SGR	Piston	C210	GASEPV	GASEPV	0.47	0.00	0.47	0.00
SGR	Piston	C310	BEC58P	BEC58P	0.15	0.00	0.15	0.00
SGR	Piston	C340	BEC58P	BEC58P	0.11	0.00	0.11	0.00
SGR	Piston	C414	BEC58P	BEC58P	0.52	0.00	0.50	0.01
SGR	Piston	C421	BEC58P	BEC58P	0.66	0.02	0.67	0.01
SGR	Piston	COL3	GASEPV	GASEPV	0.05	0.00	0.05	0.00
SGR	Piston	COL4	GASEPV	GASEPV	0.31	0.00	0.31	0.00
SGR	Piston	DA40	GASEPV	GASEPV	0.02	0.00	0.02	0.00
SGR	Piston	M20P	GASEPV	GASEPV	0.31	0.00	0.31	0.00
SGR	Piston	M20T	GASEPV	GASEPV	0.26	0.00	0.26	0.00
SGR	Piston	P28A	BEC58P	BEC58P	0.08	0.00	0.08	0.00
SGR	Piston	P28R	GASEPV	GASEPV	0.23	0.00	0.23	0.00
SGR	Piston	P32R	GASEPV	GASEPV	0.06	0.00	0.06	0.00
SGR	Piston	PA23	BEC58P	BEC58P	0.03	0.00	0.03	0.00
SGR	Piston	PA24	GASEPV	GASEPV	0.03	0.00	0.03	0.00
SGR	Piston	PA31	BEC58P	BEC58P	0.11	0.00	0.11	0.00
SGR	Piston	PA32	GASEPV	GASEPV	0.22	0.00	0.22	0.00
SGR	Piston	PA34	BEC58P	BEC58P	0.07	0.00	0.07	0.00
SGR	Piston	PA44	BEC58P	BEC58P	0.13	0.00	0.12	0.01
SGR	Piston	PA46	GASEPV	GASEPV	0.25	0.00	0.25	0.00
SGR	Piston	SR22	GASEPV	GASEPV	1.19	0.06	1.25	0.00

Satellite Airport NIRS Type Operations Tables for 2014

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
SGR	Turbo-Prop	AC90	CNA441	CNA441	0.32	0.09	0.30	0.11
SGR	Turbo-Prop	B350	DO228	DO228	0.41	0.00	0.39	0.01
SGR	Turbo-Prop	BE10	CNA441	CNA441	0.04	0.00	0.03	0.00
SGR	Turbo-Prop	BE20	CNA441	CNA441	1.83	0.09	1.48	0.45
SGR	Turbo-Prop	BE30	DO228	DO228	0.08	0.00	0.08	0.00
SGR	Turbo-Prop	BE9L	CNA441	CNA441	0.33	0.01	0.34	0.00
SGR	Turbo-Prop	C425	CNA441	CNA441	0.13	0.00	0.13	0.00
SGR	Turbo-Prop	C441	CNA441	CNA441	0.37	0.00	0.35	0.02
SGR	Turbo-Prop	G159	HS748A	HS748A	0.04	0.00	0.04	0.00
SGR	Turbo-Prop	MU2	CNA441	CNA441	0.00	0.06	0.00	0.06
SGR	Turbo-Prop	P180	SD330	SD330	0.46	0.00	0.46	0.00
SGR	Turbo-Prop	P46T	CNA208	CNA208	0.14	0.00	0.14	0.00
SGR	Turbo-Prop	PC12	CNA208	CNA208	0.30	0.00	0.30	0.00
SGR	Turbo-Prop	SW3	CNA441	CNA441	0.15	0.00	0.15	0.00
SGR	Turbo-Prop	SW4	DHC6	DHC6	0.14	0.00	0.14	0.00
SGR	Turbo-Prop	TBM7	CNA208	CNA208	0.07	0.00	0.07	0.00

HOU/IAH 2019 Operations									
APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	AC	Jet	A318	A319-131	A319-131	0.05	0.00	0.05	0.00
HOU	AC	Jet	A319	A319-131	A319-131	1.71	1.02	1.60	1.13
HOU	AC	Jet	A320	A320-211	A320-211	0.00	0.02	0.00	0.02
HOU	AC	Jet	A320	A320-232	A320-232	0.51	0.45	0.64	0.32
HOU	AC	Jet	B712	717200	717200	3.39	0.80	3.41	0.78
HOU	AC	Jet	B733	7373B2	7373B2	46.54	3.67	47.82	2.40
HOU	AC	Jet	B734	737400	737400	0.29	0.00	0.29	0.00
HOU	AC	Jet	B735	737500	737500	10.36	0.87	10.60	0.64
HOU	AC	Jet	B737	737700	737700	109.29	12.61	111.51	10.39
HOU	AC	Jet	B738	737700	737800	0.11	0.02	0.09	0.03
HOU	AC	Jet	CRJ7	CRJ9-ER	CRJ9-ER	0.62	0.00	0.60	0.02
HOU	AC	Jet	CRJ9	CRJ9-ER	CRJ9-ER	4.59	1.07	4.93	0.72
HOU	AC	Jet	CRJ9	CRJ9-LR	CRJ9-LR	0.45	0.09	0.50	0.05
HOU	AC	Jet	DC95	DC95HW	DC95HW	0.63	0.05	0.44	0.24
HOU	AC	Jet	E170	737500	737500	0.33	0.00	0.33	0.00
HOU	AC	Jet	E190	A319-131	A319-131	0.61	0.56	1.17	0.00
HOU	AC	Jet	MD83	MD9025	MD83	0.06	0.00	0.06	0.00
HOU	AC	Jet	MD88	MD9025	MD83	0.39	0.01	0.38	0.01
HOU	AT	Jet	BE40	MU3001	MU3001	0.95	0.00	0.93	0.02
HOU	AT	Jet	C25A	CNA500	CNA500	0.01	0.00	0.01	0.00
HOU	AT	Jet	C25B	CNA500	CNA500	0.63	0.00	0.63	0.00
HOU	AT	Jet	C550	CNA55B	CNA55B	0.12	0.00	0.12	0.00
HOU	AT	Jet	C560	MU3001	MU3001	0.70	0.00	0.67	0.03
HOU	AT	Jet	C56X	CNA55B	CNA55B	5.47	0.20	5.48	0.19
HOU	AT	Jet	C650	CIT3	CIT3	0.27	0.04	0.31	0.00
HOU	AT	Jet	C680	LEAR35	LEAR35	1.89	0.00	1.77	0.12
HOU	AT	Jet	C750	CNA750	CNA750	3.46	0.19	3.48	0.17
HOU	AT	Jet	CL30	CL601	CL601	0.94	0.06	1.01	0.00
HOU	AT	Jet	CL60	CL600	CL600	0.11	0.00	0.11	0.00
HOU	AT	Jet	CL60	CL601	CL601	0.45	0.00	0.45	0.00
HOU	AT	Jet	CRJ2	CL601	CL601	0.09	0.00	0.09	0.00

IAH/HOU NIRS Type Operations Tables for 2019

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	AT	Jet	E135	EMB145	EMB145	2.41	0.01	2.42	0.00
HOU	AT	Jet	E145	EMB145	EMB145	3.94	0.74	3.91	0.76
HOU	AT	Jet	E145	EMB145	EMB14L	4.47	0.84	4.39	0.92
HOU	AT	Jet	E45X	EMB145	EMB14L	0.13	0.00	0.13	0.00
HOU	AT	Jet	E50P	CNA510	CNA510	0.46	0.00	0.46	0.00
HOU	AT	Jet	F2TH	CL600	CL600	1.06	0.06	1.12	0.00
HOU	AT	Jet	FA20	CL600	CL600	0.04	0.00	0.00	0.04
HOU	AT	Jet	FA50	F10062	F10062	0.44	0.01	0.40	0.05
HOU	AT	Jet	GALX	CL600	CL600	0.90	0.04	0.87	0.07
HOU	AT	Jet	H25B	LEAR35	LEAR35	1.64	0.00	1.64	0.00
HOU	AT	Jet	HA4T	CL600	CL600	0.05	0.00	0.05	0.00
HOU	AT	Jet	J328	CL600	CL600	0.00	0.09	0.09	0.00
HOU	AT	Jet	LJ35	LEAR35	LEAR35	0.29	0.05	0.24	0.10
HOU	AT	Jet	LJ40	LEAR35	LEAR35	0.47	0.00	0.47	0.00
HOU	AT	Jet	LJ45	LEAR35	LEAR35	0.53	0.00	0.50	0.03
HOU	AT	Jet	LJ60	CNA55B	CNA55B	0.65	0.05	0.65	0.05
HOU	AT	Piston	BE35	GASEPV	GASEPV	0.05	0.00	0.05	0.00
HOU	AT	Piston	BE36	GASEPV	GASEPV	0.68	0.18	0.85	0.01
HOU	AT	Piston	BE58	BEC58P	BEC58P	0.07	0.00	0.07	0.00
HOU	AT	Piston	C172	CNA172	CNA172	0.04	0.00	0.04	0.00
HOU	AT	Piston	C182	CNA182	CNA182	0.06	0.00	0.06	0.00
HOU	AT	Piston	C210	GASEPV	GASEPV	1.16	0.18	0.46	0.89
HOU	AT	Piston	C310	BEC58P	BEC58P	0.14	0.00	0.14	0.00
HOU	AT	Piston	C402	BEC58P	BEC58P	0.02	0.55	0.56	0.00
HOU	AT	Piston	PA32	GASEPV	GASEPV	0.06	0.00	0.06	0.00
HOU	AT	Turbo-Prop	BE10	CNA441	CNA441	0.00	0.01	0.01	0.00
HOU	AT	Turbo-Prop	BE20	CNA441	CNA441	0.15	0.07	0.12	0.10
HOU	AT	Turbo-Prop	BE99	CNA441	CNA441	0.04	0.00	0.04	0.00
HOU	AT	Turbo-Prop	BE9L	CNA441	CNA441	0.34	0.00	0.34	0.00
HOU	AT	Turbo-Prop	MU2	CNA441	CNA441	0.04	0.00	0.04	0.00
HOU	AT	Turbo-Prop	P180	SD330	SD330	1.88	0.00	1.83	0.05

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	AT	Turbo-Prop	SW4	DHC6	DHC6	0.09	0.00	0.09	0.00
HOU	GA	Jet	ASTR	IA1125	IA1125	0.53	0.05	0.54	0.04
HOU	GA	Jet	B722	727EM2	727EM2	0.01	0.05	0.06	0.00
HOU	GA	Jet	B737	737700	737700	0.03	0.03	0.06	0.00
HOU	GA	Jet	BE40	MU3001	MU3001	1.26	0.08	1.24	0.09
HOU	GA	Jet	C25A	CNA500	CNA500	1.03	0.10	1.01	0.12
HOU	GA	Jet	C25B	CNA500	CNA500	0.70	0.00	0.70	0.00
HOU	GA	Jet	C25C	CNA500	CNA500	0.42	0.00	0.40	0.02
HOU	GA	Jet	C500	CNA500	CNA500	0.12	0.01	0.12	0.01
HOU	GA	Jet	C501	CNA500	CNA500	0.55	0.02	0.55	0.02
HOU	GA	Jet	C510	CNA510	CNA510	0.75	0.12	0.78	0.09
HOU	GA	Jet	C525	CNA500	CNA500	1.21	0.00	1.12	0.09
HOU	GA	Jet	C550	CNA500	CNA500	0.47	0.02	0.48	0.02
HOU	GA	Jet	C550	CNA55B	CNA55B	0.99	0.07	0.96	0.09
HOU	GA	Jet	C550	MU3001	MU3001	0.41	0.04	0.46	0.00
HOU	GA	Jet	C560	CNA55B	CNA55B	0.17	0.01	0.18	0.00
HOU	GA	Jet	C560	MU3001	MU3001	2.36	0.13	2.37	0.12
HOU	GA	Jet	C56X	CNA55B	CNA55B	2.02	0.09	2.11	0.00
HOU	GA	Jet	C650	CIT3	CIT3	2.04	0.18	2.06	0.16
HOU	GA	Jet	C650	LEAR35	LEAR35	0.03	0.00	0.03	0.00
HOU	GA	Jet	C680	LEAR35	LEAR35	0.41	0.00	0.41	0.00
HOU	GA	Jet	C750	CNA750	CNA750	1.33	0.09	1.33	0.09
HOU	GA	Jet	CL30	CL601	CL601	0.73	0.04	0.70	0.06
HOU	GA	Jet	CL60	CL600	CL600	0.85	0.07	0.81	0.11
HOU	GA	Jet	CL60	CL601	CL601	1.52	0.12	1.56	0.08
HOU	GA	Jet	E135	EMB145	EMB145	0.08	0.00	0.08	0.00
HOU	GA	Jet	E50P	CNA510	CNA510	0.21	0.00	0.21	0.00
HOU	GA	Jet	E55P	CNA55B	CNA55B	0.33	0.00	0.33	0.00
HOU	GA	Jet	EA50	ECLIPSE500	ECLIPSE500	0.21	0.00	0.21	0.00
HOU	GA	Jet	F2TH	CL600	CL600	1.57	0.12	1.68	0.00
HOU	GA	Jet	F900	F10062	F10062	0.34	0.04	0.36	0.03

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	GA	Jet	FA10	LEAR35	LEAR35	0.23	0.04	0.26	0.00
HOU	GA	Jet	FA20	CL600	CL600	0.15	0.00	0.15	0.00
HOU	GA	Jet	FA50	F10062	F10062	0.86	0.05	0.86	0.05
HOU	GA	Jet	FA7X	F10062	F10062	0.04	0.00	0.04	0.00
HOU	GA	Jet	G150	IA1125	IA1125	1.71	0.11	1.77	0.06
HOU	GA	Jet	GALX	CL600	CL600	0.66	0.00	0.60	0.05
HOU	GA	Jet	GLEX	GV	GV	0.12	0.00	0.12	0.00
HOU	GA	Jet	GLF3	GIIB	GIIB	0.46	0.00	0.46	0.00
HOU	GA	Jet	GLF4	GIV	GIV	3.17	0.25	3.14	0.29
HOU	GA	Jet	GLF5	GV	GV	0.99	0.11	1.02	0.08
HOU	GA	Jet	H25B	LEAR35	LEAR35	5.14	0.35	4.89	0.59
HOU	GA	Jet	H25C	LEAR35	LEAR35	0.09	0.00	0.09	0.00
HOU	GA	Jet	HA4T	CL600	CL600	0.23	0.00	0.23	0.00
HOU	GA	Jet	J328	CL600	CL600	0.12	0.00	0.00	0.12
HOU	GA	Jet	LJ31	LEAR35	LEAR35	0.67	0.02	0.65	0.04
HOU	GA	Jet	LJ35	LEAR35	LEAR35	0.55	0.00	0.55	0.00
HOU	GA	Jet	LJ40	LEAR35	LEAR35	0.26	0.00	0.26	0.00
HOU	GA	Jet	LJ45	LEAR35	LEAR35	2.80	0.18	2.78	0.20
HOU	GA	Jet	LJ55	LEAR35	LEAR35	0.67	0.09	0.71	0.05
HOU	GA	Jet	LJ60	CNA55B	CNA55B	0.83	0.07	0.86	0.05
HOU	GA	Jet	MU30	MU3001	MU3001	0.13	0.02	0.13	0.03
HOU	GA	Jet	PRM1	LEAR35	LEAR35	0.54	0.00	0.50	0.05
HOU	GA	Jet	WW24	IA1125	IA1125	1.30	0.15	1.32	0.13
HOU	GA	Piston	AEST	BEC58P	BEC58P	0.06	0.00	0.06	0.00
HOU	GA	Piston	BE33	GASEPV	GASEPV	0.10	0.00	0.10	0.00
HOU	GA	Piston	BE35	GASEPV	GASEPV	0.14	0.00	0.14	0.00
HOU	GA	Piston	BE36	GASEPV	GASEPV	0.78	0.00	0.78	0.00
HOU	GA	Piston	BE55	BEC58P	BEC58P	0.21	0.00	0.21	0.00
HOU	GA	Piston	BE58	BEC58P	BEC58P	0.59	0.00	0.59	0.00
HOU	GA	Piston	BE60	BEC58P	BEC58P	0.15	0.00	0.15	0.00
HOU	GA	Piston	C172	CNA172	CNA172	0.27	0.03	0.23	0.06

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	GA	Piston	C182	CNA182	CNA182	0.18	0.00	0.18	0.00
HOU	GA	Piston	C206	GASEPV	GASEPV	0.09	0.00	0.09	0.00
HOU	GA	Piston	C210	GASEPV	GASEPV	0.16	0.00	0.16	0.00
HOU	GA	Piston	C310	BEC58P	BEC58P	0.12	0.00	0.12	0.00
HOU	GA	Piston	C340	BEC58P	BEC58P	0.14	0.00	0.14	0.00
HOU	GA	Piston	C414	BEC58P	BEC58P	0.19	0.01	0.18	0.02
HOU	GA	Piston	C421	BEC58P	BEC58P	0.50	0.04	0.43	0.10
HOU	GA	Piston	DA40	GASEPV	GASEPV	0.02	0.00	0.02	0.00
HOU	GA	Piston	LEG2	GASEPV	GASEPV	0.09	0.00	0.09	0.00
HOU	GA	Piston	M20P	GASEPV	GASEPV	0.26	0.00	0.22	0.05
HOU	GA	Piston	M20T	GASEPV	GASEPV	0.06	0.00	0.06	0.00
HOU	GA	Piston	P28A	BEC58P	BEC58P	0.06	0.00	0.06	0.00
HOU	GA	Piston	PA24	GASEPV	GASEPV	0.03	0.00	0.03	0.00
HOU	GA	Piston	PA31	BEC58P	BEC58P	0.23	0.00	0.23	0.00
HOU	GA	Piston	PA32	GASEPV	GASEPV	0.10	0.00	0.10	0.00
HOU	GA	Piston	PA34	BEC58P	BEC58P	0.16	0.03	0.19	0.00
HOU	GA	Piston	PA46	GASEPV	GASEPV	0.23	0.00	0.23	0.00
HOU	GA	Piston	SR20	GASEPV	GASEPV	0.12	0.00	0.12	0.00
HOU	GA	Piston	SR22	GASEPV	GASEPV	0.70	0.00	0.70	0.00
HOU	GA	Turbo-Prop	AC90	CNA441	CNA441	0.13	0.00	0.13	0.00
HOU	GA	Turbo-Prop	AC95	CNA441	CNA441	0.02	0.00	0.02	0.00
HOU	GA	Turbo-Prop	B350	DO228	DO228	3.40	0.24	3.43	0.22
HOU	GA	Turbo-Prop	B350	LEAR35	LEAR35	0.00	0.03	0.03	0.00
HOU	GA	Turbo-Prop	BE10	CNA441	CNA441	0.17	0.00	0.17	0.00
HOU	GA	Turbo-Prop	BE20	CNA441	CNA441	3.60	0.23	3.61	0.22
HOU	GA	Turbo-Prop	BE30	DO228	DO228	0.61	0.03	0.64	0.00
HOU	GA	Turbo-Prop	BE9L	CNA441	CNA441	1.43	0.04	1.35	0.11
HOU	GA	Turbo-Prop	BE9T	CNA441	CNA441	0.25	0.02	0.27	0.00
HOU	GA	Turbo-Prop	C208	CNA208	CNA208	0.18	0.00	0.18	0.00
HOU	GA	Turbo-Prop	C425	CNA441	CNA441	0.10	0.00	0.10	0.00
HOU	GA	Turbo-Prop	C441	CNA441	CNA441	0.13	0.01	0.12	0.01

IAH/HOU NIRS Type Operations Tables for 2019

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
HOU	GA	Turbo-Prop	MU2	CNA441	CNA441	0.55	0.00	0.49	0.06
HOU	GA	Turbo-Prop	P46T	CNA208	CNA208	0.23	0.00	0.23	0.00
HOU	GA	Turbo-Prop	PAY1	CNA441	CNA441	0.19	0.00	0.17	0.02
HOU	GA	Turbo-Prop	PAY2	CNA441	CNA441	0.26	0.00	0.24	0.02
HOU	GA	Turbo-Prop	PC12	CNA208	CNA208	1.95	0.14	1.95	0.14
HOU	GA	Turbo-Prop	SW3	CNA441	CNA441	0.13	0.00	0.13	0.00
HOU	GA	Turbo-Prop	TBM7	CNA208	CNA208	0.21	0.00	0.19	0.01
HOU	GA	Turbo-Prop	TBM8	CNA208	CNA208	0.12	0.02	0.14	0.00
IAH	AC	Jet	A306	A300-622R	A300-622R	0.45	1.54	0.64	1.36
IAH	AC	Jet	A319	A319-131	A319-131	4.57	0.51	4.37	0.72
IAH	AC	Jet	A320	A320-211	A320-211	0.29	0.14	0.31	0.12
IAH	AC	Jet	A320	A320-232	A320-232	2.37	1.09	3.02	0.44
IAH	AC	Jet	B722	727EM2	727EM2	0.00	0.03	0.00	0.03
IAH	AC	Jet	B733	7373B2	7373B2	1.98	1.08	2.26	0.80
IAH	AC	Jet	B734	737400	737400	5.06	0.90	5.33	0.63
IAH	AC	Jet	B735	737500	737500	33.27	2.15	34.96	0.46
IAH	AC	Jet	B737	737700	737700	41.90	3.53	42.88	2.55
IAH	AC	Jet	B738	737700	737800	139.83	15.96	150.07	5.72
IAH	AC	Jet	B739	737700	737800	54.33	6.28	59.21	1.40
IAH	AC	Jet	B742	74720A	74720A	0.04	0.00	0.00	0.04
IAH	AC	Jet	B742	74720B	74720B	0.00	0.02	0.02	0.00
IAH	AC	Jet	B744	747400	747400	2.43	1.52	2.75	1.20
IAH	AC	Jet	B752	757PW	757PW	1.28	0.69	1.45	0.51
IAH	AC	Jet	B752	757RR	757RR	10.79	1.50	11.63	0.66
IAH	AC	Jet	B753	757RR	757300	17.23	2.36	18.93	0.66
IAH	AC	Jet	B762	767CF6	767CF6	2.20	1.89	3.38	0.70
IAH	AC	Jet	B762	767JT9	767JT9	0.22	0.17	0.16	0.24
IAH	AC	Jet	B763	767300	767300	1.64	1.22	2.58	0.28
IAH	AC	Jet	B764	A330-343	767400	4.99	2.10	6.86	0.24
IAH	AC	Jet	B772	A310-304	777200	7.86	0.34	8.00	0.20
IAH	AC	Jet	B77L	A310-304	777300	0.00	0.00	0.61	0.00

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IAH	AC	Jet	B77W	A310-304	777300	2.94	0.00	2.33	0.00
IAH	AC	Jet	B787	A330-343	A330-343	49.22	0.78	49.98	0.02
IAH	AC	Jet	CRJ7	CRJ9-ER	CRJ9-ER	43.65	4.70	45.76	2.60
IAH	AC	Jet	CRJ9	CRJ9-ER	CRJ9-ER	11.28	2.00	12.47	0.81
IAH	AC	Jet	CRJ9	CRJ9-LR	CRJ9-LR	6.29	0.49	6.62	0.16
IAH	AC	Jet	DC10	DC1010	DC1010	0.17	0.86	0.21	0.82
IAH	AC	Jet	DC10	DC1030	DC1030	0.05	0.19	0.06	0.18
IAH	AC	Jet	DC87	DC870	DC870	0.74	0.31	0.59	0.46
IAH	AC	Jet	DC95	DC95HW	DC95HW	0.85	0.11	0.96	0.00
IAH	AC	Jet	E170	737500	737500	8.12	0.35	7.36	1.11
IAH	AC	Jet	E190	A319-131	A319-131	1.18	0.00	0.86	0.32
IAH	AC	Jet	MD11	727D17	MD11GE	0.35	0.20	0.02	0.53
IAH	AC	Jet	MD11	727D17	MD11PW	0.24	0.13	0.00	0.37
IAH	AC	Jet	MD82	MD9025	MD82	4.08	0.15	4.23	0.00
IAH	AC	Jet	MD83	MD9025	MD83	1.60	0.06	1.61	0.06
IAH	AC	Jet	MD88	MD9025	MD83	2.56	0.53	2.59	0.50
IAH	AC	Jet	MD90	MD9028	MD9028	0.19	0.00	0.19	0.00
IAH	AC	High-Performance Turbo-Prop	DH8D	DHC830	DHC830	21.26	1.00	21.25	1.01
IAH	AT	Jet	BE40	MU3001	MU3001	0.13	0.00	0.13	0.00
IAH	AT	Jet	C560	MU3001	MU3001	0.56	0.00	0.56	0.00
IAH	AT	Jet	C680	LEAR35	LEAR35	0.44	0.02	0.45	0.00
IAH	AT	Jet	C750	CNA750	CNA750	0.48	0.02	0.50	0.00
IAH	AT	Jet	CRJ2	CL601	CL601	9.54	0.60	9.08	1.06
IAH	AT	Jet	E135	EMB145	EMB145	0.06	0.00	0.07	0.00
IAH	AT	Jet	E145	EMB145	EMB145	46.68	1.67	47.72	0.64
IAH	AT	Jet	E145	EMB145	EMB14L	196.92	7.84	201.82	2.93
IAH	AT	Jet	E45X	EMB145	EMB14L	107.11	3.27	108.56	1.83
IAH	AT	Jet	F2TH	CL600	CL600	0.22	0.00	0.19	0.03
IAH	AT	Jet	GALX	CL600	CL600	0.07	0.00	0.07	0.00

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IAH	AT	Jet	H25B	LEAR35	LEAR35	0.28	0.00	0.28	0.00
IAH	AT	Turbo-Prop	SF34	SF340	SF340	43.16	2.77	43.96	1.98
IAH	AT	Turbo-Prop	SH36	SD330	SD330	0.74	0.01	0.75	0.00
IAH	AT	Turbo-Prop	SW4	DHC6	DHC6	0.69	0.03	0.72	0.00
IAH	GA	Jet	BE40	MU3001	MU3001	0.28	0.00	0.28	0.00
IAH	GA	Jet	C25A	CNA500	CNA500	0.09	0.00	0.09	0.00
IAH	GA	Jet	C25B	CNA500	CNA500	0.03	0.00	0.03	0.00
IAH	GA	Jet	C500	CNA500	CNA500	0.05	0.00	0.05	0.00
IAH	GA	Jet	C525	CNA500	CNA500	0.19	0.00	0.19	0.00
IAH	GA	Jet	C550	CNA500	CNA500	0.07	0.00	0.07	0.00
IAH	GA	Jet	C550	CNA55B	CNA55B	0.08	0.00	0.08	0.00
IAH	GA	Jet	C550	MU3001	MU3001	0.18	0.00	0.18	0.00
IAH	GA	Jet	C560	MU3001	MU3001	1.39	0.00	1.28	0.11
IAH	GA	Jet	C650	CIT3	CIT3	0.19	0.03	0.22	0.00
IAH	GA	Jet	C680	LEAR35	LEAR35	0.85	0.00	0.78	0.07
IAH	GA	Jet	CL30	CL601	CL601	1.38	0.05	1.28	0.14
IAH	GA	Jet	CL60	CL600	CL600	0.04	0.00	0.04	0.00
IAH	GA	Jet	CL60	CL601	CL601	0.18	0.00	0.18	0.00
IAH	GA	Jet	E135	EMB145	EMB145	0.00	0.04	0.04	0.00
IAH	GA	Jet	F2TH	CL600	CL600	0.51	0.00	0.00	0.51
IAH	GA	Jet	F900	F10062	F10062	0.50	0.03	0.49	0.03
IAH	GA	Jet	FA20	CL600	CL600	0.08	0.00	0.08	0.00
IAH	GA	Jet	FA50	F10062	F10062	0.43	0.00	0.43	0.00
IAH	GA	Jet	GALX	CL600	CL600	0.05	0.00	0.05	0.00
IAH	GA	Jet	GLEX	GV	GV	0.28	0.02	0.24	0.06
IAH	GA	Jet	GLF4	GIV	GIV	1.32	0.11	1.33	0.10
IAH	GA	Jet	GLF5	GV	GV	1.52	0.18	1.57	0.13
IAH	GA	Jet	H25B	LEAR35	LEAR35	1.10	0.00	1.04	0.07
IAH	GA	Jet	LJ31	LEAR35	LEAR35	0.07	0.00	0.07	0.00
IAH	GA	Jet	LJ35	LEAR35	LEAR35	0.11	0.00	0.11	0.00
IAH	GA	Jet	LJ45	LEAR35	LEAR35	0.70	0.00	0.64	0.07

IAH/HOU NIRS Type Operations Tables for 2019

APT	TAF Group	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IAH	GA	Jet	WW24	IA1125	IA1125	0.13	0.00	0.13	0.00
IAH	GA	Piston	BE58	BEC58P	BEC58P	0.18	0.00	0.18	0.00
IAH	GA	Piston	C310	BEC58P	BEC58P	0.17	0.00	0.17	0.00
IAH	GA	Piston	C421	BEC58P	BEC58P	0.30	0.00	0.30	0.00
IAH	GA	Piston	PA32	GASEPV	GASEPV	0.39	0.00	0.39	0.00
IAH	GA	Piston	PA46	GASEPV	GASEPV	0.16	0.00	0.16	0.00
IAH	GA	Piston	SR22	GASEPV	GASEPV	0.39	0.00	0.39	0.00
IAH	GA	Turbo-Prop	B350	DO228	DO228	0.31	0.01	0.32	0.00
IAH	GA	Turbo-Prop	BE10	CNA441	CNA441	0.04	0.00	0.04	0.00
IAH	GA	Turbo-Prop	BE20	CNA441	CNA441	0.66	0.00	0.66	0.00
IAH	GA	Turbo-Prop	BE30	DO228	DO228	0.11	0.00	0.11	0.00
IAH	GA	Turbo-Prop	BE9L	CNA441	CNA441	0.17	0.00	0.17	0.00
IAH	GA	Turbo-Prop	P180	SD330	SD330	0.05	0.00	0.05	0.00

Satellite 2019 Operations								
Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
DWH	Jet	BE40	MU3001	MU3001	1.4	0.1	1.4	0.0
DWH	Jet	C25A	CNA500	CNA500	0.1	0.0	0.1	0.0
DWH	Jet	C25B	CNA500	CNA500	0.2	0.0	0.2	0.0
DWH	Jet	C500	CNA500	CNA500	0.1	0.0	0.1	0.0
DWH	Jet	C501	CNA500	CNA500	0.1	0.0	0.1	0.0
DWH	Jet	C510	CNA510	CNA510	0.6	0.1	0.6	0.0
DWH	Jet	C525	CNA500	CNA500	0.2	0.0	0.2	0.0
DWH	Jet	C550	CNA500	CNA500	0.1	0.0	0.1	0.0
DWH	Jet	C550	CNA55B	CNA55B	0.2	0.0	0.3	0.0
DWH	Jet	C550	MU3001	MU3001	0.1	0.0	0.0	0.1
DWH	Jet	C560	MU3001	MU3001	0.7	0.1	0.8	0.0
DWH	Jet	C56X	CNA55B	CNA55B	1.5	0.0	1.5	0.0
DWH	Jet	C650	CIT3	CIT3	0.3	0.0	0.3	0.0
DWH	Jet	C680	LEAR35	LEAR35	0.5	0.0	0.5	0.0
DWH	Jet	C750	CNA750	CNA750	0.4	0.0	0.4	0.0
DWH	Jet	CL30	CL601	CL601	0.1	0.0	0.1	0.0
DWH	Jet	CL60	CL601	CL601	0.2	0.0	0.2	0.0
DWH	Jet	E135	EMB145	EMB145	0.0	0.0	0.0	0.0
DWH	Jet	E55P	CNA55B	CNA55B	0.0	0.0	0.0	0.0
DWH	Jet	EA50	ECLIPSE500	ECLIPSE500	0.1	0.0	0.1	0.0
DWH	Jet	F2TH	CL600	CL600	0.2	0.0	0.2	0.0
DWH	Jet	FA20	CL600	CL600	0.3	0.0	0.3	0.0
DWH	Jet	FA50	F10062	F10062	0.1	0.0	0.1	0.0
DWH	Jet	GALX	CL600	CL600	0.1	0.0	0.1	0.0
DWH	Jet	GLF4	GIV	GIV	0.5	0.1	0.7	0.0
DWH	Jet	H25B	LEAR35	LEAR35	0.5	0.0	0.5	0.0
DWH	Jet	LJ31	LEAR35	LEAR35	0.1	0.0	0.1	0.0
DWH	Jet	LJ35	LEAR35	LEAR35	0.1	0.0	0.1	0.0
DWH	Jet	LJ45	LEAR35	LEAR35	0.2	0.0	0.2	0.0
DWH	Jet	LJ55	LEAR35	LEAR35	0.0	0.0	0.0	0.0
DWH	Jet	LJ60	CNA55B	CNA55B	0.4	0.0	0.4	0.0

Satellite Airport NIRS Type Operations Tables for 2019

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
DWH	Jet	PRM1	LEAR35	LEAR35	0.1	0.0	0.1	0.0
DWH	Jet	WW24	IA1125	IA1125	0.2	0.0	0.2	0.0
DWH	Piston	AA5	GASEPF	GASEPF	0.1	0.0	0.1	0.0
DWH	Piston	AC11	GASEPV	GASEPV	0.1	0.0	0.1	0.0
DWH	Piston	AEST	BEC58P	BEC58P	0.1	0.0	0.1	0.0
DWH	Piston	B36T	GASEPV	GASEPV	0.0	0.0	0.0	0.0
DWH	Piston	BE33	GASEPV	GASEPV	0.3	0.0	0.3	0.0
DWH	Piston	BE35	GASEPV	GASEPV	0.4	0.0	0.4	0.0
DWH	Piston	BE36	GASEPV	GASEPV	1.1	0.0	1.1	0.0
DWH	Piston	BE55	BEC58P	BEC58P	0.5	0.0	0.5	0.0
DWH	Piston	BE58	BEC58P	BEC58P	0.4	0.0	0.4	0.0
DWH	Piston	BL17	GASEPV	GASEPV	0.0	0.0	0.0	0.0
DWH	Piston	C172	CNA172	CNA172	4.2	0.2	4.3	0.0
DWH	Piston	C177	CNA172	CNA172	0.0	0.0	0.0	0.0
DWH	Piston	C182	CNA182	CNA182	1.2	0.0	1.3	0.0
DWH	Piston	C206	GASEPV	GASEPV	0.2	0.0	0.2	0.0
DWH	Piston	C210	GASEPV	GASEPV	0.6	0.0	0.6	0.0
DWH	Piston	C310	BEC58P	BEC58P	0.3	0.0	0.3	0.0
DWH	Piston	C340	BEC58P	BEC58P	0.1	0.0	0.1	0.0
DWH	Piston	C402	BEC58P	BEC58P	0.1	0.0	0.1	0.0
DWH	Piston	C414	BEC58P	BEC58P	0.3	0.0	0.3	0.0
DWH	Piston	C421	BEC58P	BEC58P	0.5	0.0	0.5	0.0
DWH	Piston	C72R	CNA172	CNA172	0.1	0.0	0.1	0.0
DWH	Piston	C82R	CNA182	CNA182	0.1	0.0	0.1	0.0
DWH	Piston	COL3	GASEPV	GASEPV	0.2	0.0	0.2	0.0
DWH	Piston	COL4	GASEPV	GASEPV	0.2	0.0	0.2	0.0
DWH	Piston	M200	GASEPV	GASEPV	0.0	0.0	0.0	0.0
DWH	Piston	M20P	GASEPV	GASEPV	0.5	0.0	0.5	0.0
DWH	Piston	P28A	BEC58P	BEC58P	0.4	0.0	0.4	0.0
DWH	Piston	P28R	GASEPV	GASEPV	0.1	0.0	0.1	0.0
DWH	Piston	P32R	GASEPV	GASEPV	0.2	0.0	0.2	0.0

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
DWH	Piston	P32T	GASEPV	GASEPV	0.1	0.0	0.1	0.0
DWH	Piston	PA24	GASEPV	GASEPV	0.1	0.0	0.1	0.0
DWH	Piston	PA32	GASEPV	GASEPV	0.3	0.0	0.3	0.0
DWH	Piston	PA34	BEC58P	BEC58P	0.1	0.0	0.1	0.0
DWH	Piston	PA44	BEC58P	BEC58P	0.9	0.1	1.0	0.0
DWH	Piston	PA46	GASEPV	GASEPV	0.2	0.0	0.2	0.0
DWH	Piston	SR20	GASEPV	GASEPV	0.1	0.0	0.1	0.0
DWH	Piston	SR22	GASEPV	GASEPV	1.1	0.1	1.1	0.1
DWH	Piston	T34T	GASEPV	GASEPV	0.4	0.0	0.4	0.0
DWH	Piston	TEX2	GASEPV	GASEPV	0.4	0.0	0.4	0.0
DWH	Turbo-Prop	AC90	CNA441	CNA441	0.1	0.0	0.1	0.0
DWH	Turbo-Prop	B350	DO228	DO228	0.4	0.0	0.4	0.0
DWH	Turbo-Prop	BE10	CNA441	CNA441	0.0	0.0	0.0	0.0
DWH	Turbo-Prop	BE20	CNA441	CNA441	1.4	0.1	1.5	0.0
DWH	Turbo-Prop	BE30	DO228	DO228	0.3	0.0	0.3	0.0
DWH	Turbo-Prop	BE9L	CNA441	CNA441	0.6	0.0	0.6	0.0
DWH	Turbo-Prop	BE9T	CNA441	CNA441	0.0	0.0	0.0	0.0
DWH	Turbo-Prop	C425	CNA441	CNA441	0.0	0.0	0.0	0.0
DWH	Turbo-Prop	C441	CNA441	CNA441	0.0	0.0	0.0	0.0
DWH	Turbo-Prop	P180	SD330	SD330	0.4	0.0	0.4	0.0
DWH	Turbo-Prop	P46T	CNA208	CNA208	0.5	0.0	0.5	0.0
DWH	Turbo-Prop	PC12	CNA208	CNA208	1.5	0.1	1.5	0.2
DWH	Turbo-Prop	SW3	CNA441	CNA441	0.2	0.0	0.2	0.0
DWH	Turbo-Prop	TBM7	CNA208	CNA208	0.2	0.0	0.2	0.0
DWH	Turbo-Prop	TBM8	CNA208	CNA208	0.3	0.0	0.3	0.0
EFD	Jet	B722	727EM2	727EM2	0.19	0.00	0.19	0.00
EFD	Jet	BE40	MU3001	MU3001	0.93	0.40	1.33	0.00
EFD	Jet	C25A	CNA500	CNA500	0.11	0.00	0.11	0.00
EFD	Jet	C25B	CNA500	CNA500	0.31	0.00	0.31	0.00
EFD	Jet	C500	CNA500	CNA500	0.00	0.00	0.00	0.00
EFD	Jet	C501	CNA500	CNA500	0.04	0.00	0.04	0.00

Satellite Airport NIRS Type Operations Tables for 2019

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
EFD	Jet	C525	CNA500	CNA500	0.09	0.00	0.09	0.00
EFD	Jet	C550	MU3001	MU3001	0.30	0.00	0.30	0.00
EFD	Jet	C560	MU3001	MU3001	0.56	0.00	0.56	0.00
EFD	Jet	C56X	CNA55B	CNA55B	0.24	0.00	0.24	0.00
EFD	Jet	C650	CIT3	CIT3	0.23	0.00	0.23	0.00
EFD	Jet	C680	LEAR35	LEAR35	0.13	0.00	0.13	0.00
EFD	Jet	C750	CNA750	CNA750	0.09	0.00	0.09	0.00
EFD	Jet	CL60	CL601	CL601	0.12	0.00	0.12	0.00
EFD	Jet	E135	EMB145	EMB145	0.06	0.00	0.06	0.00
EFD	Jet	E6	DC870	DC870	0.02	0.00	0.02	0.00
EFD	Jet	EA50	ECLIPSE500	ECLIPSE500	0.18	0.01	0.19	0.00
EFD	Jet	F16	LEAR25	LEAR25	0.75	0.00	0.75	0.00
EFD	Jet	F18	A7D	LEAR25	0.42	0.00	0.42	0.00
EFD	Jet	FA18	A7D	LEAR25	0.02	0.00	0.02	0.00
EFD	Jet	FA20	CL600	CL600	0.22	0.00	0.22	0.00
EFD	Jet	G150	IA1125	IA1125	1.17	0.03	1.20	0.00
EFD	Jet	GL5T	GV	GV	0.00	0.00	0.00	0.00
EFD	Jet	GLF2	GIIB	GIIB	0.42	0.00	0.42	0.00
EFD	Jet	GLF4	GIV	GIV	0.19	0.00	0.19	0.00
EFD	Jet	H25B	LEAR35	LEAR35	0.62	0.03	0.61	0.04
EFD	Jet	HAWK	A7D	A7D	0.94	0.00	0.94	0.00
EFD	Jet	LJ35	LEAR35	LEAR35	0.04	0.00	0.04	0.00
EFD	Jet	LJ60	CNA55B	CNA55B	0.40	0.00	0.40	0.00
EFD	Jet	MD82	MD9025	MD82	0.00	0.00	0.00	0.00
EFD	Jet	MD83	MD9025	MD83	0.21	0.00	0.21	0.00
EFD	Jet	SBR1	LEAR35	LEAR35	0.05	0.00	0.04	0.00
EFD	Jet	T38	LEAR25	LEAR25	8.76	0.21	8.97	0.00
EFD	Piston	BE35	GASEPV	GASEPV	0.18	0.00	0.18	0.00
EFD	Piston	BE36	GASEPV	GASEPV	0.38	0.00	0.38	0.00
EFD	Piston	BE55	BEC58P	BEC58P	0.13	0.00	0.13	0.00
EFD	Piston	BE58	BEC58P	BEC58P	0.41	0.07	0.48	0.00

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
EFD	Piston	C177	CNA172	CNA172	0.03	0.00	0.03	0.00
EFD	Piston	C182	CNA182	CNA182	0.46	0.00	0.41	0.04
EFD	Piston	C210	GASEPV	GASEPV	0.42	0.00	0.30	0.12
EFD	Piston	C340	BEC58P	BEC58P	0.15	0.00	0.15	0.00
EFD	Piston	C402	BEC58P	BEC58P	0.01	0.00	0.01	0.00
EFD	Piston	C414	BEC58P	BEC58P	0.26	0.00	0.26	0.00
EFD	Piston	C421	BEC58P	BEC58P	1.01	0.00	1.01	0.00
EFD	Piston	COL4	GASEPV	GASEPV	0.21	0.00	0.21	0.00
EFD	Piston	DA40	GASEPV	GASEPV	0.16	0.01	0.18	0.00
EFD	Piston	DA42	BEC58P	BEC58P	0.01	0.00	0.01	0.00
EFD	Piston	M20P	GASEPV	GASEPV	0.46	0.00	0.44	0.02
EFD	Piston	P28A	BEC58P	BEC58P	0.16	0.00	0.16	0.00
EFD	Piston	P28R	GASEPV	GASEPV	0.19	0.00	0.17	0.02
EFD	Piston	P32R	GASEPV	GASEPV	0.13	0.00	0.13	0.00
EFD	Piston	P32T	GASEPV	GASEPV	0.04	0.00	0.04	0.00
EFD	Piston	PA31	BEC58P	BEC58P	0.24	0.00	0.24	0.00
EFD	Piston	PA32	GASEPV	GASEPV	0.31	0.00	0.30	0.01
EFD	Piston	PA44	BEC58P	BEC58P	0.33	0.00	0.33	0.00
EFD	Piston	PA46	GASEPV	GASEPV	0.20	0.00	0.20	0.00
EFD	Piston	SR20	GASEPV	GASEPV	1.16	0.00	1.16	0.00
EFD	Piston	SR22	GASEPV	GASEPV	1.01	0.00	1.01	0.00
EFD	Piston	T18	GASEPV	GASEPV	0.04	0.00	0.04	0.00
EFD	Piston	T34T	GASEPV	GASEPV	0.36	0.00	0.36	0.00
EFD	Turbo-Prop	BE20	CNA441	CNA441	0.63	0.00	0.63	0.00
EFD	Turbo-Prop	BE9L	CNA441	CNA441	0.71	0.00	0.65	0.06
EFD	Turbo-Prop	C130	C130	C130	0.35	0.00	0.35	0.00
EFD	Turbo-Prop	C441	CNA441	CNA441	0.11	0.00	0.11	0.00
EFD	Turbo-Prop	MU2	CNA441	CNA441	0.16	0.00	0.16	0.00
EFD	Turbo-Prop	P46T	CNA208	CNA208	0.20	0.00	0.20	0.00
EFD	Turbo-Prop	PC12	CNA208	CNA208	0.25	0.02	0.26	0.01
EFD	Turbo-Prop	TBM7	CNA208	CNA208	0.10	0.00	0.10	0.00

Satellite Airport NIRS Type Operations Tables for 2019

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IWS	Jet	C25C	CNA500	CNA500	0.26	0.00	0.26	0.00
IWS	Jet	C501	CNA500	CNA500	0.09	0.00	0.09	0.00
IWS	Jet	C510	CNA510	CNA510	1.00	0.00	1.00	0.00
IWS	Jet	C525	CNA500	CNA500	0.19	0.01	0.19	0.01
IWS	Jet	C550	MU3001	MU3001	0.26	0.00	0.26	0.00
IWS	Jet	LJ40	LEAR35	LEAR35	0.04	0.00	0.04	0.00
IWS	Piston	BE33	GASEPV	GASEPV	0.41	0.00	0.39	0.02
IWS	Piston	BE35	GASEPV	GASEPV	0.70	0.00	0.70	0.00
IWS	Piston	BE36	GASEPV	GASEPV	1.31	0.00	1.31	0.00
IWS	Piston	BE55	BEC58P	BEC58P	0.71	0.00	0.68	0.03
IWS	Piston	BE58	BEC58P	BEC58P	1.54	0.00	1.54	0.00
IWS	Piston	BE60	BEC58P	BEC58P	0.00	0.26	0.26	0.00
IWS	Piston	C172	CNA172	CNA172	1.42	0.00	1.42	0.00
IWS	Piston	C182	CNA182	CNA182	1.23	0.00	1.15	0.09
IWS	Piston	C206	GASEPV	GASEPV	0.27	0.00	0.27	0.00
IWS	Piston	C320	BEC58P	BEC58P	0.00	0.00	0.00	0.00
IWS	Piston	C340	BEC58P	BEC58P	0.21	0.00	0.21	0.00
IWS	Piston	C414	BEC58P	BEC58P	0.14	0.00	0.14	0.00
IWS	Piston	C421	BEC58P	BEC58P	0.69	0.00	0.67	0.02
IWS	Piston	COL3	GASEPV	GASEPV	0.14	0.00	0.14	0.00
IWS	Piston	DA40	GASEPV	GASEPV	0.25	0.00	0.25	0.00
IWS	Piston	M20P	GASEPV	GASEPV	0.30	0.02	0.32	0.00
IWS	Piston	P28B	BEC58P	BEC58P	0.12	0.00	0.12	0.00
IWS	Piston	P28R	GASEPV	GASEPV	0.07	0.00	0.07	0.00
IWS	Piston	P32R	GASEPV	GASEPV	0.33	0.00	0.32	0.01
IWS	Piston	P32T	GASEPV	GASEPV	0.07	0.00	0.07	0.00
IWS	Piston	PA24	GASEPV	GASEPV	0.27	0.00	0.27	0.00
IWS	Piston	PA31	BEC58P	BEC58P	0.11	0.00	0.11	0.00
IWS	Piston	PA32	GASEPV	GASEPV	0.56	0.00	0.56	0.00
IWS	Piston	PA46	GASEPV	GASEPV	1.10	0.00	1.03	0.07
IWS	Piston	SR22	GASEPV	GASEPV	0.79	0.01	0.77	0.02

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
IWS	Turbo-Prop	B350	DO228	DO228	0.25	0.00	0.25	0.00
IWS	Turbo-Prop	BE20	CNA441	CNA441	1.52	0.02	1.49	0.05
IWS	Turbo-Prop	BE9L	CNA441	CNA441	0.51	0.00	0.47	0.05
IWS	Turbo-Prop	BE9T	CNA441	CNA441	0.04	0.00	0.04	0.00
IWS	Turbo-Prop	C208	CNA208	CNA208	0.35	0.00	0.35	0.00
IWS	Turbo-Prop	C425	CNA441	CNA441	0.44	0.00	0.43	0.01
IWS	Turbo-Prop	C441	CNA441	CNA441	0.25	0.00	0.25	0.00
IWS	Turbo-Prop	P46T	CNA208	CNA208	0.53	0.00	0.53	0.00
IWS	Turbo-Prop	PC12	CNA208	CNA208	2.07	0.00	2.07	0.00
IWS	Turbo-Prop	SW3	CNA441	CNA441	0.04	0.00	0.04	0.00
LBX	Jet	C25B	CNA500	CNA500	0.00	0.02	0.02	0.00
LBX	Jet	C525	CNA500	CNA500	0.11	0.00	0.11	0.00
LBX	Jet	C560	MU3001	MU3001	0.07	0.00	0.07	0.00
LBX	Jet	CRJ7	CRJ9-ER	CRJ9-ER	4.04	0.00	4.04	0.00
LBX	Jet	F2TH	CL600	CL600	0.10	0.00	0.10	0.00
LBX	Jet	H25B	LEAR35	LEAR35	0.09	0.02	0.11	0.00
LBX	Jet	LJ55	LEAR35	LEAR35	0.00	0.01	0.00	0.01
LBX	Piston	BE35	GASEPV	GASEPV	0.14	0.00	0.14	0.00
LBX	Piston	C172	CNA172	CNA172	0.88	0.00	0.88	0.00
LBX	Piston	C182	CNA182	CNA182	0.27	0.00	0.27	0.00
LBX	Piston	C210	GASEPV	GASEPV	1.86	0.00	0.46	1.40
LBX	Piston	PA24	GASEPV	GASEPV	0.57	0.00	0.17	0.40
SGR	Jet	BE40	MU3001	MU3001	0.80	0.00	0.80	0.00
SGR	Jet	C25A	CNA500	CNA500	0.40	0.00	0.40	0.00
SGR	Jet	C25B	CNA500	CNA500	0.82	0.02	0.79	0.04
SGR	Jet	C501	CNA500	CNA500	0.42	0.00	0.41	0.02
SGR	Jet	C525	CNA500	CNA500	0.73	0.00	0.73	0.00
SGR	Jet	C550	CNA55B	CNA55B	0.27	0.00	0.27	0.00
SGR	Jet	C550	MU3001	MU3001	0.32	0.00	0.32	0.00
SGR	Jet	C560	MU3001	MU3001	1.16	0.03	1.15	0.04
SGR	Jet	C56X	CNA55B	CNA55B	1.89	0.06	1.90	0.06

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
SGR	Jet	C650	CIT3	CIT3	2.08	0.10	1.62	0.55
SGR	Jet	C680	LEAR35	LEAR35	1.01	0.00	1.01	0.00
SGR	Jet	C750	CNA750	CNA750	1.23	0.06	1.23	0.06
SGR	Jet	CL30	CL601	CL601	0.48	0.00	0.45	0.03
SGR	Jet	CL60	CL600	CL600	0.21	0.00	0.19	0.03
SGR	Jet	CL60	CL601	CL601	0.36	0.03	0.39	0.00
SGR	Jet	E135	EMB145	EMB145	0.09	0.01	0.10	0.00
SGR	Jet	E50P	CNA510	CNA510	0.54	0.66	0.00	1.19
SGR	Jet	E55P	CNA55B	CNA55B	0.15	0.00	0.15	0.00
SGR	Jet	EA50	ECLIPSE500	ECLIPSE500	0.17	0.00	0.17	0.00
SGR	Jet	F2TH	CL600	CL600	1.05	0.06	1.11	0.00
SGR	Jet	F900	F10062	F10062	0.26	0.00	0.26	0.00
SGR	Jet	FA10	LEAR35	LEAR35	0.05	0.00	0.05	0.00
SGR	Jet	FA20	CL600	CL600	0.18	0.00	0.18	0.00
SGR	Jet	FA50	F10062	F10062	0.20	0.00	0.20	0.00
SGR	Jet	GALX	CL600	CL600	0.45	0.00	0.45	0.00
SGR	Jet	GLEX	GV	GV	0.06	0.00	0.06	0.00
SGR	Jet	GLF4	GIV	GIV	0.84	0.00	0.84	0.00
SGR	Jet	GLF5	GV	GV	0.20	0.00	0.20	0.00
SGR	Jet	H25B	LEAR35	LEAR35	0.89	0.00	0.89	0.00
SGR	Jet	H25C	LEAR35	LEAR35	0.00	0.00	0.00	0.00
SGR	Jet	LJ35	LEAR35	LEAR35	0.20	0.00	0.20	0.00
SGR	Jet	LJ40	LEAR35	LEAR35	0.40	0.00	0.40	0.00
SGR	Jet	LJ45	LEAR35	LEAR35	0.64	0.05	0.65	0.04
SGR	Jet	LJ55	LEAR35	LEAR35	0.09	0.00	0.09	0.00
SGR	Jet	LJ60	CNA55B	CNA55B	1.12	0.07	1.04	0.15
SGR	Jet	PRM1	LEAR35	LEAR35	0.22	0.00	0.21	0.00
SGR	Jet	WW24	IA1125	IA1125	0.19	0.04	0.23	0.00
SGR	Piston	AC50	BEC58P	BEC58P	0.87	0.00	0.87	0.00
SGR	Piston	AEST	BEC58P	BEC58P	0.13	0.00	0.13	0.00
SGR	Piston	BE33	GASEPV	GASEPV	0.07	0.00	0.07	0.00

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
SGR	Piston	BE35	GASEPV	GASEPV	0.34	0.00	0.34	0.00
SGR	Piston	BE36	GASEPV	GASEPV	0.42	0.00	0.41	0.01
SGR	Piston	BE55	BEC58P	BEC58P	0.29	0.00	0.29	0.00
SGR	Piston	BE58	BEC58P	BEC58P	0.30	0.00	0.30	0.00
SGR	Piston	BE60	BEC58P	BEC58P	0.13	0.00	0.13	0.00
SGR	Piston	C172	CNA172	CNA172	1.68	0.06	1.65	0.08
SGR	Piston	C182	CNA182	CNA182	0.70	0.00	0.70	0.00
SGR	Piston	C206	GASEPV	GASEPV	0.24	0.00	0.24	0.00
SGR	Piston	C210	GASEPV	GASEPV	0.47	0.00	0.47	0.00
SGR	Piston	C310	BEC58P	BEC58P	0.15	0.00	0.15	0.00
SGR	Piston	C340	BEC58P	BEC58P	0.11	0.00	0.11	0.00
SGR	Piston	C414	BEC58P	BEC58P	0.52	0.00	0.50	0.01
SGR	Piston	C421	BEC58P	BEC58P	0.66	0.02	0.67	0.01
SGR	Piston	COL3	GASEPV	GASEPV	0.07	0.00	0.07	0.00
SGR	Piston	COL4	GASEPV	GASEPV	0.41	0.00	0.41	0.00
SGR	Piston	DA40	GASEPV	GASEPV	0.03	0.00	0.03	0.00
SGR	Piston	M20P	GASEPV	GASEPV	0.31	0.00	0.31	0.00
SGR	Piston	M20T	GASEPV	GASEPV	0.26	0.00	0.26	0.00
SGR	Piston	P28A	BEC58P	BEC58P	0.08	0.00	0.08	0.00
SGR	Piston	P28R	GASEPV	GASEPV	0.23	0.00	0.23	0.00
SGR	Piston	P32R	GASEPV	GASEPV	0.06	0.00	0.06	0.00
SGR	Piston	PA23	BEC58P	BEC58P	0.03	0.00	0.03	0.00
SGR	Piston	PA24	GASEPV	GASEPV	0.03	0.00	0.03	0.00
SGR	Piston	PA31	BEC58P	BEC58P	0.11	0.00	0.11	0.00
SGR	Piston	PA32	GASEPV	GASEPV	0.22	0.00	0.22	0.00
SGR	Piston	PA34	BEC58P	BEC58P	0.07	0.00	0.07	0.00
SGR	Piston	PA44	BEC58P	BEC58P	0.13	0.00	0.12	0.01
SGR	Piston	PA46	GASEPV	GASEPV	0.25	0.00	0.25	0.00
SGR	Piston	SR22	GASEPV	GASEPV	1.19	0.06	1.25	0.00
SGR	Turbo-Prop	AC90	CNA441	CNA441	0.32	0.09	0.30	0.11
SGR	Turbo-Prop	B350	DO228	DO228	0.51	0.00	0.49	0.02

Airport	Engine Type	Aircraft Type	NIRS Type: Arrival	NIRS Type: Departure	Day Arrivals	Night Arrivals	Day Departures	Night Departures
SGR	Turbo-Prop	BE10	CNA441	CNA441	0.04	0.00	0.03	0.00
SGR	Turbo-Prop	BE20	CNA441	CNA441	1.83	0.09	1.48	0.45
SGR	Turbo-Prop	BE30	DO228	DO228	0.08	0.00	0.08	0.00
SGR	Turbo-Prop	BE9L	CNA441	CNA441	0.33	0.01	0.34	0.00
SGR	Turbo-Prop	C425	CNA441	CNA441	0.13	0.00	0.13	0.00
SGR	Turbo-Prop	C441	CNA441	CNA441	0.37	0.00	0.35	0.02
SGR	Turbo-Prop	G159	HS748A	HS748A	0.04	0.00	0.04	0.00
SGR	Turbo-Prop	MU2	CNA441	CNA441	0.00	0.06	0.00	0.06
SGR	Turbo-Prop	P180	SD330	SD330	0.57	0.00	0.57	0.00
SGR	Turbo-Prop	P46T	CNA208	CNA208	0.14	0.00	0.14	0.00
SGR	Turbo-Prop	PC12	CNA208	CNA208	0.37	0.00	0.37	0.00
SGR	Turbo-Prop	SW3	CNA441	CNA441	0.15	0.00	0.15	0.00
SGR	Turbo-Prop	SW4	DHC6	DHC6	0.14	0.00	0.14	0.00
SGR	Turbo-Prop	TBM7	CNA208	CNA208	0.07	0.00	0.07	0.00

Appendix C Runway Use Tables

2012 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
IAH	Jets	08L	9.61%	0.15%	0.00%	0.00%
		08R	15.68%	33.15%	0.66%	0.01%
		9	1.15%	0.43%	9.16%	6.99%
		15L	0.01%	1.17%	52.55%	71.23%
		15R	0.03%	1.63%	26.20%	7.68%
		26L	33.49%	17.31%	2.37%	9.67%
		26R	6.54%	0.07%	0.99%	0.00%
		27	33.50%	46.05%	1.00%	0.00%
		33L	0.00%	0.00%	3.34%	1.86%
		33R	0.00%	0.03%	3.74%	2.56%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	08L	19.23%	-	0.00%	-
		08R	0.00%	-	0.00%	-
		9	24.55%	-	0.00%	-
		15L	0.00%	-	18.83%	-
		15R	0.00%	-	43.53%	-
		26L	22.66%	-	24.34%	-
		26R	33.56%	-	0.00%	-
		27	0.00%	-	3.11%	-
		33L	0.00%	-	0.00%	-
		33R	0.00%	-	10.19%	-
		Total	**100.00%**	**-**	**100.00%**	**-**
	High-Performance Turbo-Props	08L	11.37%	0.00%	0.00%	0.00%
		08R	15.13%	33.65%	1.36%	0.00%
		9	0.92%	0.00%	9.85%	0.00%
		15L	0.00%	0.00%	47.53%	87.87%
		15R	0.00%	0.00%	30.54%	12.13%
		26L	46.02%	27.36%	2.66%	0.00%
		26R	12.19%	0.94%	0.62%	0.00%
		27	14.37%	38.05%	0.00%	0.00%
		33L	0.00%	0.00%	3.20%	0.00%
		33R	0.00%	0.00%	4.25%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	08L	16.86%	0.00%	0.00%	0.00%
		08R	8.75%	23.96%	1.16%	0.00%
		9	0.59%	0.00%	6.84%	0.00%
		15L	0.02%	0.00%	42.52%	88.75%
		15R	0.14%	0.59%	36.55%	11.25%
		26L	46.05%	33.26%	3.07%	0.00%
		26R	20.32%	2.13%	1.45%	0.00%
		27	7.28%	40.05%	0.81%	0.00%
		33L	0.00%	0.00%	2.11%	0.00%
		33R	0.00%	0.00%	5.49%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2012 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
	All Aircraft	08L	10.14%	0.14%	0.00%	0.00%
		08R	15.18%	32.74%	0.71%	0.01%
		9	1.16%	0.41%	9.01%	6.40%
		15L	0.01%	1.10%	51.72%	72.70%
		15R	0.03%	1.56%	27.00%	8.01%
		26L	34.58%	18.17%	2.47%	8.85%
		26R	7.64%	0.18%	1.01%	0.00%
		27	31.26%	45.67%	0.97%	0.00%
		33L	0.00%	0.00%	3.25%	1.70%
		33R	0.00%	0.03%	3.88%	2.34%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2012 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
HOU	Jets	4	23.77%	38.75%	5.07%	9.48%
		12L	0.86%	0.03%	0.15%	0.04%
		12R	60.57%	58.14%	42.32%	48.80%
		17	1.10%	0.50%	0.75%	0.00%
		22	4.40%	0.95%	41.75%	40.04%
		30L	8.79%	1.46%	7.48%	0.40%
		30R	0.01%	0.00%	1.05%	0.16%
		35	0.48%	0.18%	1.43%	1.09%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	4	30.85%	52.42%	3.15%	4.89%
		12L	26.33%	0.55%	3.10%	0.00%
		12R	31.33%	47.02%	14.35%	36.66%
		17	3.14%	0.00%	10.30%	0.00%
		22	2.30%	0.00%	47.99%	26.42%
		30L	3.26%	0.00%	4.34%	21.62%
		30R	1.08%	0.00%	11.58%	8.09%
		35	1.71%	0.00%	5.19%	2.31%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	4	22.81%	27.76%	3.46%	19.58%
		12L	26.17%	9.20%	5.52%	1.03%
		12R	28.97%	39.90%	12.66%	28.11%
		17	7.11%	21.58%	11.99%	2.07%
		22	3.31%	0.00%	47.59%	34.00%
		30L	5.96%	0.00%	2.64%	9.16%
		30R	2.11%	0.00%	9.92%	1.84%
		35	3.54%	1.56%	6.22%	4.21%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	All Aircraft	4	23.96%	39.02%	4.90%	9.69%
		12L	3.46%	0.36%	0.60%	0.08%
		12R	57.42%	57.00%	39.42%	47.11%
		17	1.58%	1.19%	1.81%	0.10%
		22	4.25%	0.87%	42.35%	38.96%
		30L	8.41%	1.34%	7.05%	2.05%
		30R	0.19%	0.00%	1.99%	0.70%
		35	0.73%	0.22%	1.88%	1.31%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2012 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
DWH	Jets	17L	0.54%	0.00%	0.00%	0.00%
		17R	57.67%	78.12%	68.03%	28.85%
		35L	40.02%	21.88%	31.97%	71.15%
		35R	1.76%	0.00%	0.00%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	17L	0.93%	0.00%	0.00%	0.00%
		17R	65.73%	62.55%	76.40%	48.06%
		35L	32.80%	37.45%	22.55%	51.94%
		35R	0.54%	0.00%	1.05%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	17L	0.00%	0.00%	0.86%	0.00%
		17R	65.65%	93.11%	63.22%	93.08%
		35L	34.35%	6.89%	35.92%	6.92%
		35R	0.00%	0.00%	0.00%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	All Aircraft	17L	0.64%	0.00%	0.16%	0.00%
		17R	63.23%	77.00%	71.39%	50.51%
		35L	35.32%	23.00%	27.92%	49.49%
		35R	0.82%	0.00%	0.53%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2012 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
EFD	Jets	4	10.94%	0.00%	15.49%	8.98%
		17R	42.96%	69.98%	37.15%	0.00%
		35L	38.35%	30.02%	41.60%	91.02%
		22	7.76%	0.00%	5.76%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	4	5.19%	0.00%	9.21%	0.00%
		17R	50.25%	100.00%	46.04%	30.68%
		35L	38.46%	0.00%	37.02%	69.32%
		22	6.10%	0.00%	7.73%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	4	6.37%	0.00%	3.71%	0.00%
		17R	57.95%	100.00%	42.20%	90.52%
		35L	27.67%	0.00%	38.56%	0.00%
		22	8.00%	0.00%	15.53%	9.48%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	All Aircraft	4	8.85%	0.00%	12.71%	1.33%
		17R	46.40%	73.93%	40.11%	38.39%
		35L	37.45%	26.07%	40.04%	58.35%
		22	7.29%	0.00%	7.14%	1.94%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2012 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
IWS	Jets	15	60.51%	0.00%	67.98%	100.00%
		33	39.49%	100.00%	32.02%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	15	95.05%	100.00%	68.32%	78.96%
		33	4.95%	0.00%	31.68%	21.04%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	15	63.16%	100.00%	66.83%	58.12%
		33	36.84%	0.00%	33.17%	41.88%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	All	15	82.65%	97.56%	67.86%	73.51%
		33	17.35%	2.44%	32.14%	26.49%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2012 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
LBX	Jets	17	92.12%	100.00%	79.19%	0.00%
		35	7.88%	0.00%	20.81%	100.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	17	35.51%	-	49.00%	92.23%
		35	64.49%	-	51.00%	7.77%
		Total	**100.00%**	**-**	**100.00%**	**100.00%**
	All	17	66.21%	100.00%	70.91%	91.57%
		35	33.79%	0.00%	29.09%	8.43%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2012 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
SGR	Jets	17	61.49%	75.92%	56.78%	82.86%
		35	38.51%	24.08%	43.22%	17.14%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	17	62.89%	0.00%	64.68%	88.89%
		35	37.11%	100.00%	35.32%	11.11%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	17	53.11%	40.25%	56.95%	79.06%
		35	46.89%	59.75%	43.05%	20.94%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	All	17	60.71%	63.46%	59.24%	82.18%
		35	39.29%	36.54%	40.76%	17.82%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2014 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
IAH	Jets	08L	9.98%	0.16%	0.00%	0.00%
		08R	15.27%	33.46%	0.66%	0.01%
		9	1.31%	0.44%	9.20%	7.20%
		15L	0.00%	1.15%	52.37%	71.52%
		15R	0.03%	1.56%	26.30%	7.70%
		26L	32.86%	17.36%	2.38%	9.22%
		26R	7.03%	0.07%	0.99%	0.00%
		27	33.51%	45.77%	1.00%	0.00%
		33L	0.00%	0.00%	3.33%	1.77%
		33R	0.00%	0.03%	3.75%	2.58%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	08L	19.20%	-	0.00%	-
		08R	0.00%	-	0.00%	-
		9	24.55%	-	0.00%	-
		15L	0.00%	-	18.83%	-
		15R	0.00%	-	43.53%	-
		26L	21.97%	-	24.34%	-
		26R	34.29%	-	0.00%	-
		27	0.00%	-	3.11%	-
		33L	0.00%	-	0.00%	-
		33R	0.00%	-	10.19%	-
		Total	**100.00%**	**-**	**100.00%**	**-**
	High-Performance Turbo-Props	08L	11.82%	0.00%	0.00%	0.00%
		08R	14.63%	33.65%	1.36%	0.00%
		9	1.03%	0.00%	9.85%	0.00%
		15L	0.00%	0.00%	47.53%	87.87%
		15R	0.00%	0.00%	30.54%	12.13%
		26L	45.13%	27.36%	2.66%	0.00%
		26R	13.12%	0.94%	0.62%	0.00%
		27	14.27%	38.05%	0.00%	0.00%
		33L	0.00%	0.00%	3.20%	0.00%
		33R	0.00%	0.00%	4.25%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	08L	17.31%	0.00%	0.00%	0.00%
		08R	8.38%	23.96%	1.16%	0.00%
		9	0.66%	0.00%	6.84%	0.00%
		15L	0.02%	0.00%	42.52%	88.75%
		15R	0.14%	0.59%	36.55%	11.25%
		26L	44.74%	33.26%	3.07%	0.00%
		26R	21.59%	2.13%	1.45%	0.00%
		27	7.16%	40.05%	0.81%	0.00%
		33L	0.00%	0.00%	2.11%	0.00%
		33R	0.00%	0.00%	5.49%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2014 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
Totals	All Aircraft	08L	10.48%	0.15%	0.00%	0.00%
		08R	14.81%	33.06%	0.71%	0.01%
		9	1.31%	0.42%	9.06%	6.60%
		15L	0.01%	1.08%	51.61%	72.91%
		15R	0.03%	1.50%	27.04%	8.02%
		26L	33.85%	18.16%	2.47%	8.46%
		26R	8.11%	0.17%	1.01%	0.00%
		27	31.39%	45.43%	0.97%	0.00%
		33L	0.00%	0.00%	3.25%	1.63%
		33R	0.00%	0.03%	3.88%	2.37%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2014 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
HOU	Jets	4	23.77%	38.75%	5.07%	9.47%
		12L	0.87%	0.03%	0.15%	0.04%
		12R	60.58%	58.13%	42.29%	48.77%
		17	1.11%	0.50%	0.75%	0.00%
		22	4.40%	0.95%	41.78%	40.10%
		30L	8.79%	1.46%	7.46%	0.40%
		30R	0.01%	0.00%	1.05%	0.16%
		35	0.48%	0.18%	1.44%	1.07%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	4	30.88%	52.38%	3.14%	4.88%
		12L	26.32%	0.55%	3.09%	0.00%
		12R	31.30%	47.07%	14.35%	36.60%
		17	3.16%	0.00%	10.31%	0.00%
		22	2.30%	0.00%	47.99%	26.55%
		30L	3.25%	0.00%	4.34%	21.59%
		30R	1.08%	0.00%	11.57%	8.07%
		35	1.70%	0.00%	5.22%	2.31%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	4	22.77%	27.69%	3.47%	19.47%
		12L	26.21%	9.04%	5.52%	1.05%
		12R	28.96%	39.91%	12.63%	28.11%
		17	7.10%	21.77%	11.95%	2.08%
		22	3.33%	0.00%	47.66%	34.21%
		30L	5.98%	0.00%	2.65%	9.04%
		30R	2.11%	0.00%	9.95%	1.81%
		35	3.54%	1.59%	6.17%	4.23%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Totals	All Aircraft	4	23.95%	39.01%	4.90%	9.67%
		12L	3.45%	0.35%	0.60%	0.08%
		12R	57.44%	57.01%	39.40%	47.10%
		17	1.58%	1.19%	1.81%	0.10%
		22	4.26%	0.88%	42.37%	39.04%
		30L	8.41%	1.34%	7.04%	2.02%
		30R	0.19%	0.00%	1.99%	0.69%
		35	0.72%	0.22%	1.88%	1.29%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2014 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
DWH	Jets	17L	0.53%	0.00%	0.00%	0.00%
		17R	57.67%	78.14%	68.06%	29.23%
		35L	40.04%	21.86%	31.94%	70.77%
		35R	1.76%	0.00%	0.00%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	17L	0.95%	0.00%	0.00%	0.00%
		17R	65.67%	61.09%	76.27%	48.06%
		35L	32.82%	38.91%	22.63%	51.94%
		35R	0.56%	0.00%	1.10%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	17L	0.00%	0.00%	0.84%	0.00%
		17R	65.79%	93.23%	63.13%	93.30%
		35L	34.21%	6.77%	36.02%	6.70%
		35R	0.00%	0.00%	0.00%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Totals	All Aircraft	17L	0.64%	0.00%	0.16%	0.00%
		17R	63.22%	76.49%	71.31%	51.06%
		35L	35.31%	23.51%	27.97%	48.94%
		35R	0.83%	0.00%	0.56%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2014 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
EFD	Jets	4	10.94%	0.00%	15.49%	8.98%
		17R	42.96%	69.98%	37.15%	0.00%
		35L	38.35%	30.02%	41.60%	91.02%
		22	7.76%	0.00%	5.76%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	4	5.19%	0.00%	9.21%	0.00%
		17R	50.25%	100.00%	46.04%	30.68%
		35L	38.46%	0.00%	37.02%	69.32%
		22	6.10%	0.00%	7.73%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	4	6.37%	0.00%	3.71%	0.00%
		17R	57.95%	100.00%	42.20%	90.52%
		35L	27.67%	0.00%	38.56%	0.00%
		22	8.00%	0.00%	15.53%	9.48%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Totals	All Aircraft	4	8.85%	0.00%	12.71%	1.33%
		17R	46.40%	73.93%	40.11%	38.39%
		35L	37.45%	26.07%	40.04%	58.35%
		22	7.29%	0.00%	7.14%	1.94%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2014 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
IWS	Jets	15	60.27%	0.00%	67.90%	100.00%
		33	39.73%	100.00%	32.10%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	15	95.11%	100.00%	68.13%	78.96%
		33	4.89%	0.00%	31.87%	21.04%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	15	63.16%	100.00%	66.83%	58.12%
		33	36.84%	0.00%	33.17%	41.88%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Totals	All	15	82.67%	97.56%	67.73%	73.51%
		33	17.33%	2.44%	32.27%	26.49%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2014 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
LBX	Jets	17	92.12%	100.00%	79.18%	0.00%
		35	7.88%	0.00%	20.82%	100.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	17	36.64%	-	47.13%	92.23%
		35	63.36%	-	52.87%	7.77%
		Total	**100.00%**	**-**	**100.00%**	**100.00%**
Totals	All	17	66.73%	100.00%	70.26%	91.57%
		35	33.27%	0.00%	29.74%	8.43%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2014 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
SGR	Jets	17	61.56%	75.93%	56.84%	82.75%
		35	38.44%	24.07%	43.16%	17.25%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	17	62.90%	0.00%	64.53%	89.73%
		35	37.10%	100.00%	35.47%	10.27%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	17	53.01%	40.25%	56.70%	79.10%
		35	46.99%	59.75%	43.30%	20.90%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Totals	All	17	60.74%	63.46%	59.19%	82.16%
		35	39.26%	36.54%	40.81%	17.84%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2019 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
IAH	Jets	08L	10.24%	0.16%	0.00%	0.00%
		08R	15.14%	33.33%	0.67%	0.01%
		9	1.24%	0.44%	9.83%	7.34%
		15L	0.00%	1.09%	53.07%	71.83%
		15R	0.02%	1.46%	25.06%	7.76%
		26L	32.41%	17.56%	2.32%	8.75%
		26R	6.88%	0.07%	0.94%	0.00%
		27	34.06%	45.86%	0.97%	0.00%
		33L	0.00%	0.00%	3.22%	1.69%
		33R	0.00%	0.03%	3.93%	2.60%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	08L	19.20%	-	0.00%	-
		08R	0.00%	-	0.00%	-
		9	24.55%	-	0.00%	-
		15L	0.00%	-	18.83%	-
		15R	0.00%	-	43.53%	-
		26L	21.97%	-	24.34%	-
		26R	34.29%	-	0.00%	-
		27	0.00%	-	3.11%	-
		33L	0.00%	-	0.00%	-
		33R	0.00%	-	10.19%	-
		Total	**100.00%**	**-**	**100.00%**	**-**
	High-Performance Turbo-Props	08L	11.82%	0.00%	0.00%	0.00%
		08R	14.63%	33.65%	1.36%	0.00%
		9	1.03%	0.00%	9.85%	0.00%
		15L	0.00%	0.00%	47.53%	87.87%
		15R	0.00%	0.00%	30.54%	12.13%
		26L	45.13%	27.36%	2.66%	0.00%
		26R	13.12%	0.94%	0.62%	0.00%
		27	14.27%	38.05%	0.00%	0.00%
		33L	0.00%	0.00%	3.20%	0.00%
		33R	0.00%	0.00%	4.25%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	08L	17.31%	0.00%	0.00%	0.00%
		08R	8.38%	23.96%	1.16%	0.00%
		9	0.66%	0.00%	6.84%	0.00%
		15L	0.02%	0.00%	42.51%	88.75%
		15R	0.14%	0.59%	36.56%	11.25%
		26L	44.73%	33.26%	3.06%	0.00%
		26R	21.60%	2.13%	1.45%	0.00%
		27	7.16%	40.06%	0.81%	0.00%
		33L	0.00%	0.00%	2.11%	0.00%
		33R	0.00%	0.00%	5.49%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2019 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
Totals	All Aircraft	08L	10.65%	0.16%	0.00%	0.00%
		08R	14.76%	32.97%	0.71%	0.01%
		9	1.25%	0.42%	9.66%	6.76%
		15L	0.01%	1.04%	52.36%	73.15%
		15R	0.03%	1.41%	25.78%	8.06%
		26L	33.31%	18.29%	2.40%	8.06%
		26R	7.82%	0.16%	0.96%	0.00%
		27	32.18%	45.53%	0.94%	0.00%
		33L	0.00%	0.00%	3.16%	1.56%
		33R	0.00%	0.02%	4.02%	2.40%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2019 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
HOU	Jets	4	24.38%	39.59%	4.95%	7.76%
		12L	0.72%	0.02%	0.13%	0.32%
		12R	60.40%	57.21%	43.66%	51.29%
		17	0.89%	0.42%	0.69%	0.00%
		22	4.36%	0.89%	41.01%	39.29%
		30L	8.83%	1.70%	7.39%	0.36%
		30R	0.01%	0.00%	0.91%	0.13%
		35	0.40%	0.16%	1.25%	0.86%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	4	31.02%	52.15%	3.14%	4.86%
		12L	26.15%	0.58%	3.06%	0.00%
		12R	31.33%	47.28%	14.45%	36.45%
		17	3.24%	0.00%	10.23%	0.00%
		22	2.29%	0.00%	47.92%	26.99%
		30L	3.21%	0.00%	4.33%	21.47%
		30R	1.07%	0.00%	11.53%	7.94%
		35	1.69%	0.00%	5.34%	2.29%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	4	22.64%	27.47%	3.54%	19.12%
		12L	26.31%	8.51%	5.48%	1.12%
		12R	28.94%	39.96%	12.54%	28.07%
		17	7.03%	22.37%	11.82%	2.11%
		22	3.40%	0.00%	47.92%	34.93%
		30L	6.05%	0.00%	2.68%	8.64%
		30R	2.11%	0.00%	10.04%	1.72%
		35	3.52%	1.69%	5.99%	4.30%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	All Aircraft	4	24.47%	39.69%	4.82%	8.07%
		12L	2.92%	0.29%	0.52%	0.34%
		12R	57.75%	56.36%	41.09%	49.68%
		17	1.32%	1.04%	1.58%	0.08%
		22	4.25%	0.83%	41.59%	38.54%
		30L	8.51%	1.59%	7.04%	1.67%
		30R	0.16%	0.00%	1.71%	0.55%
		35	0.62%	0.20%	1.64%	1.06%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2019 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
DWH	Jets	17L	0.41%	0.00%	0.00%	0.00%
		17R	57.63%	81.09%	68.21%	44.22%
		35L	40.06%	18.91%	31.79%	55.78%
		35R	1.89%	0.00%	0.00%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	17L	1.00%	0.00%	0.00%	0.00%
		17R	65.30%	57.64%	75.95%	48.06%
		35L	33.06%	42.36%	22.83%	51.94%
		35R	0.64%	0.00%	1.22%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	17L	0.00%	0.00%	0.81%	0.00%
		17R	66.99%	93.53%	62.93%	93.80%
		35L	33.01%	6.47%	36.26%	6.20%
		35R	0.00%	0.00%	0.00%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Totals	All Aircraft	17L	0.63%	0.00%	0.15%	0.00%
		17R	63.25%	76.25%	71.15%	62.24%
		35L	35.21%	23.75%	28.08%	37.76%
		35R	0.91%	0.00%	0.62%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2019 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
EFD	Jets	4	10.94%	0.00%	15.49%	8.98%
		17R	42.96%	69.98%	37.15%	0.00%
		35L	38.35%	30.02%	41.60%	91.02%
		22	7.76%	0.00%	5.76%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	4	5.19%	0.00%	9.21%	0.00%
		17R	50.25%	100.00%	46.04%	30.68%
		35L	38.46%	0.00%	37.02%	69.32%
		22	6.10%	0.00%	7.73%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	4	6.37%	0.00%	3.71%	0.00%
		17R	57.95%	100.00%	42.20%	90.52%
		35L	27.67%	0.00%	38.56%	0.00%
		22	8.00%	0.00%	15.53%	9.48%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	All Aircraft	4	8.85%	0.00%	12.71%	1.33%
		17R	46.40%	73.93%	40.11%	38.39%
		35L	37.45%	26.07%	40.04%	58.35%
		22	7.29%	0.00%	7.14%	1.94%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2019 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
IWS	Jets	15	59.04%	0.00%	67.46%	100.00%
		33	40.96%	100.00%	32.54%	0.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	15	95.45%	100.00%	67.14%	78.96%
		33	4.55%	0.00%	32.86%	21.04%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	15	63.17%	100.00%	66.83%	58.12%
		33	36.83%	0.00%	33.17%	41.88%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Totals	All	15	82.78%	97.56%	67.08%	73.51%
		33	17.22%	2.44%	32.92%	26.49%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

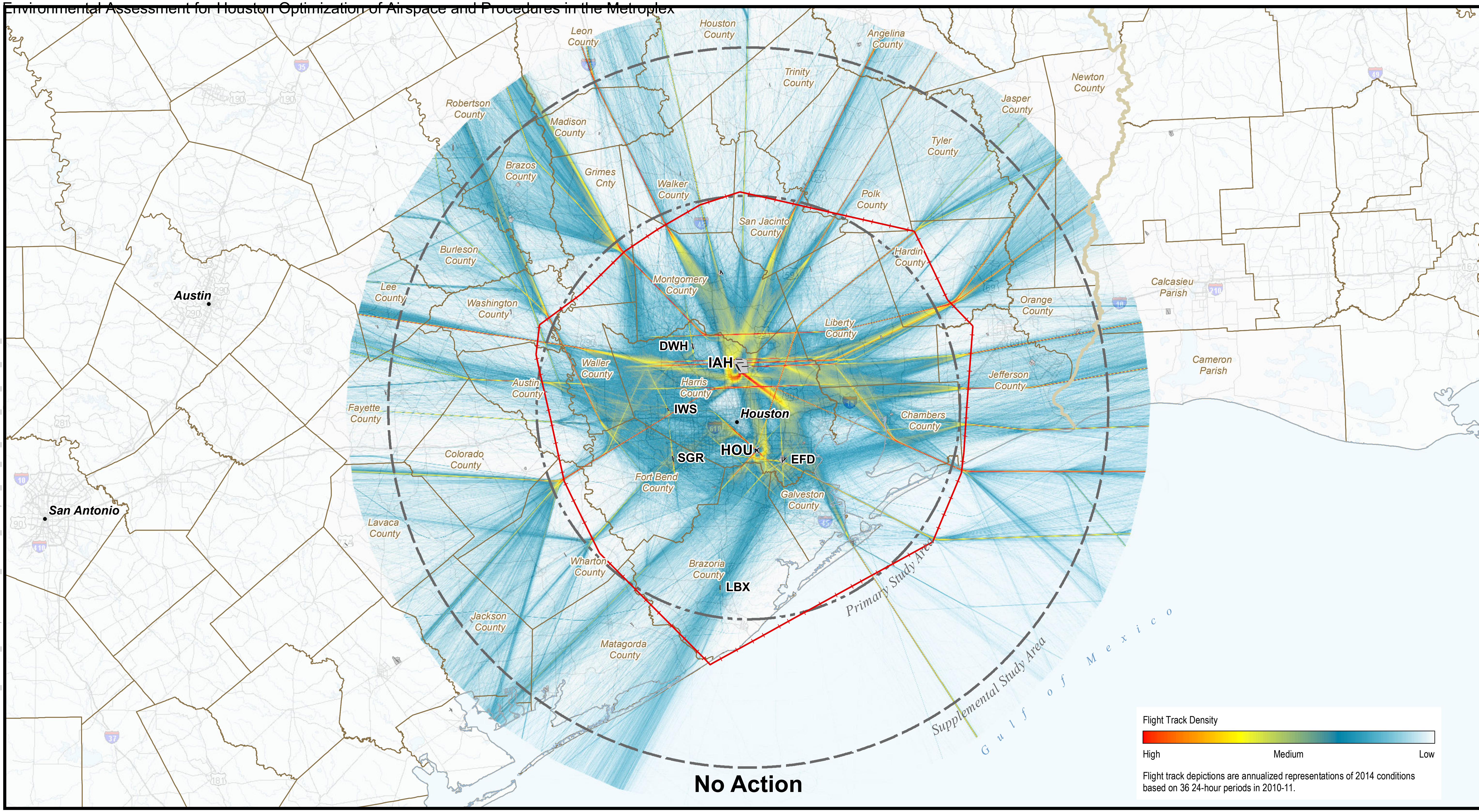
2019 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
LBX	Jets	17	92.10%	100.00%	79.12%	0.00%
		35	7.90%	0.00%	20.88%	100.00%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	17	43.03%	-	37.92%	92.23%
		35	56.97%	-	62.08%	7.77%
		Total	**100.00%**	**-**	**100.00%**	**100.00%**
Totals	All	17	69.65%	100.00%	66.71%	91.57%
		35	30.35%	0.00%	33.29%	8.43%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2019 Modeled Runway Use Tables

Airport	Engine Type	Runway	Arrivals		Departures	
			Day	Night	Day	Night
SGR	Jets	17	61.84%	75.94%	57.03%	82.48%
		35	38.16%	24.06%	42.97%	17.52%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Piston	17	62.64%	0.00%	64.17%	91.43%
		35	37.36%	100.00%	35.83%	8.57%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	Turbo-Props	17	52.88%	40.25%	56.09%	79.21%
		35	47.12%	59.75%	43.91%	20.79%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Totals	All	17	60.80%	63.47%	59.09%	82.13%
		35	39.20%	36.53%	40.91%	17.87%
		Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Appendix D Flight Track and Procedure Figures



Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated)

Prepared By: Harris Miller Miller & Hanson Inc., January, 2013

Primary Study Area
Secondary Study Area
TRACON Boundary
Interstate Highway
Highways
Secondary Roads
State Boundary
County Boundary
Water
River/Stream

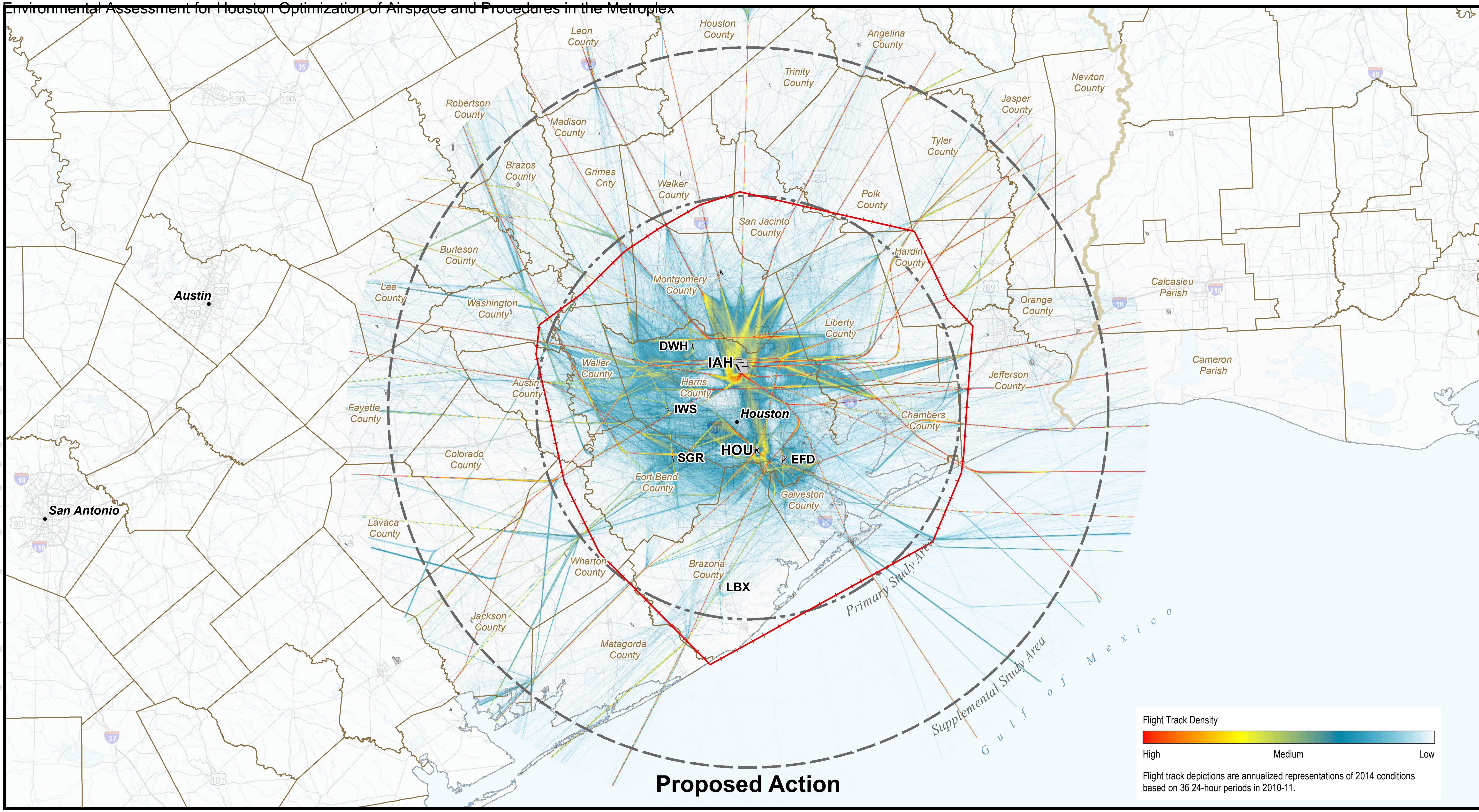
North

0 20 40 Nautical Miles

All No Action Model Tracks

Figure D-1

Houston OAPM EA



Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated)

Prepared By: Harris Miller Miller & Hanson Inc., January, 2013

Primary Study Area
Secondary Study Area
TRACON Boundary
State Boundary
County Boundary
35 Interstate Highway
Highways
Secondary Roads
Water
River/Stream

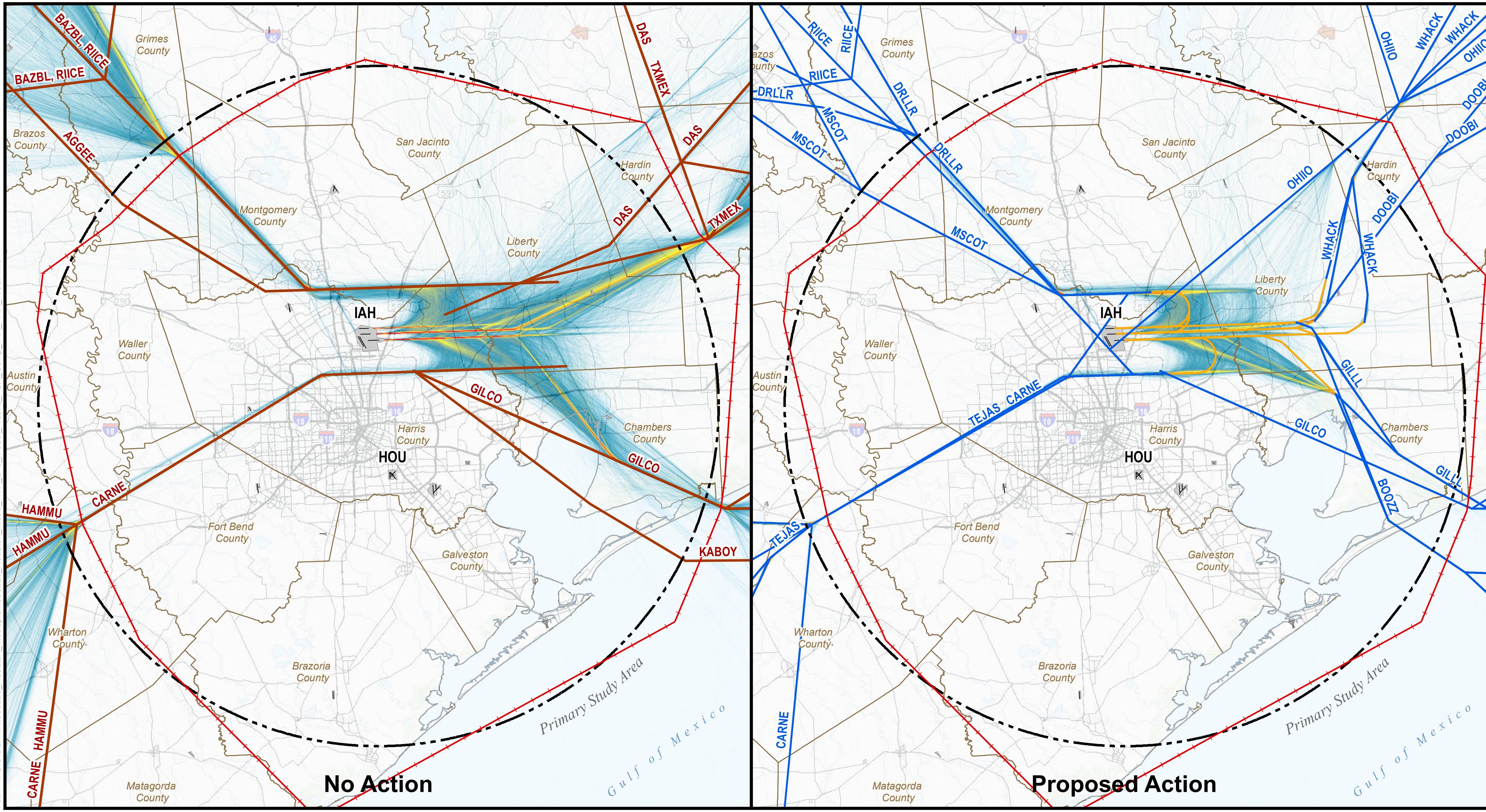
North

0 20 40 Nautical Miles

All Proposed Action Model Tracks

Figure D-2

Houston OAPM EA



Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated);

Prepared By: Harris Miller Miller & Hanson Inc., January, 2013

Primary Study Area
Core I90 TRACON Boundary
County/Parish Boundary
Alabama-Coushatta Tribe of Texas Reservation

Proposed Procedure
No Action Procedure
Proposed RNP AR Approaches and RNAV Transitions (RNP AR and ILS)

Flight Track Density
Low Medium High

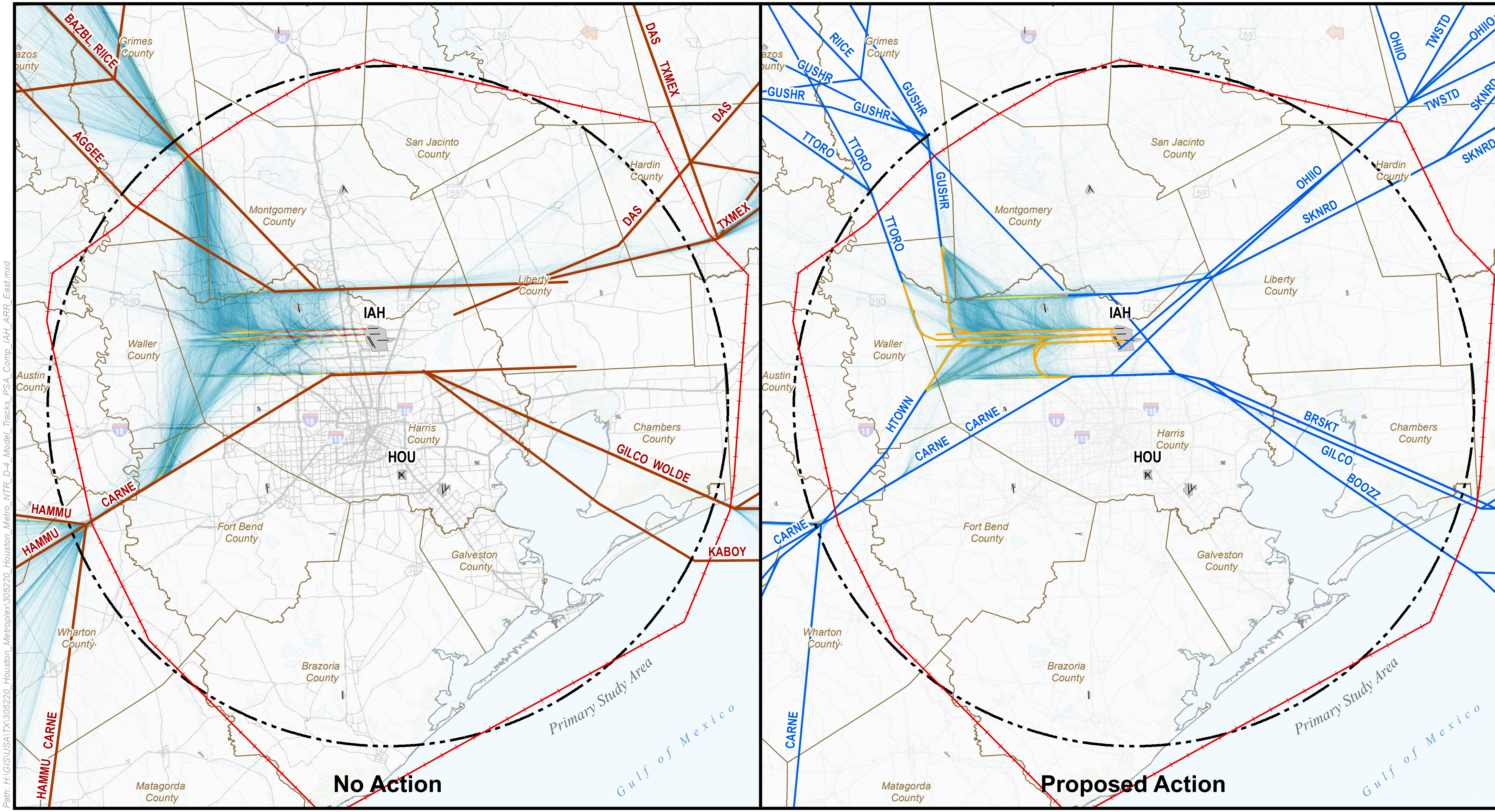
Flight track depictions are annualized representations of 2014 conditions based on 36 24-hour periods in 2010-11.

North
0 10 20 Nautical Miles

IAH Arrivals during West Flow (Comparison of Proposed Action and No Action Alternatives)

Figure D-3

HARRIS MILLER MILLER & HANSON INC.



Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated);

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North

0 10 20 Nautical Miles

Primary Study Area

Core I90 TRACON Boundary

County/Parish Boundary

Alabama-Coushatta Tribe of Texas Reservation

Proposed Procedure

No Action Procedure

Proposed RNP AR Approaches and RNAV Transitions (RNP AR and ILS)

Flight Track Density

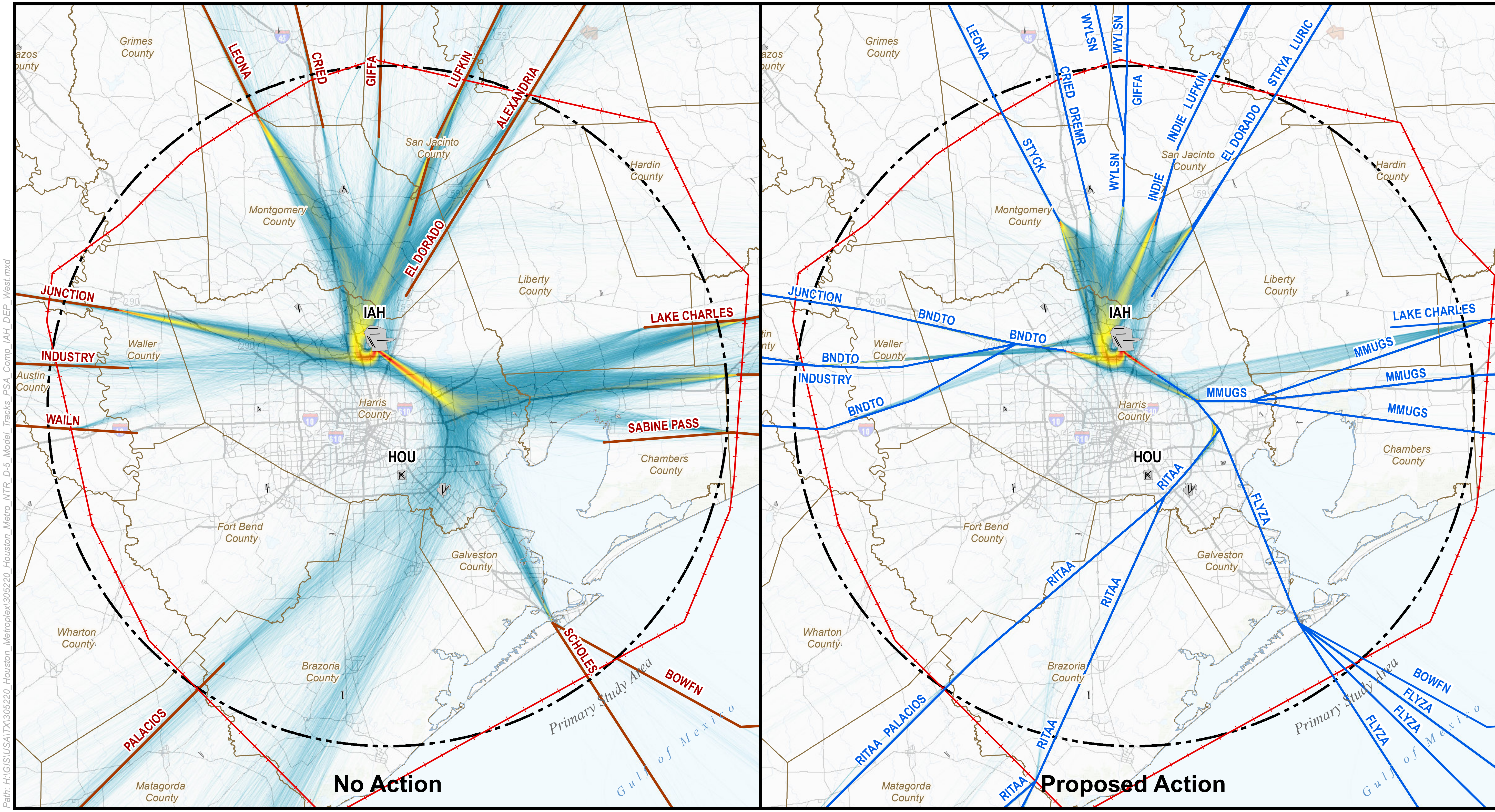
Low Medium High

Flight track depictions are annualized representations of 2014 conditions based on 36 24-hour periods in 2010-11.

IAH Arrivals during East Flow (Comparison of Proposed Action and No Action Alternatives)

Figure D-4

HARRIS MILLER MILLER & HANSON INC.



Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated)

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Primary Study Area

Core I90 TRACON Boundary

County/Parish Boundary

Alabama-Coushatta Tribe of Texas Reservation

Proposed Procedure

No Action Procedure

Flight Track Density

Low Medium High

Flight track depictions are annualized representations of 2014 conditions based on 36 24-hour periods in 2010-11.

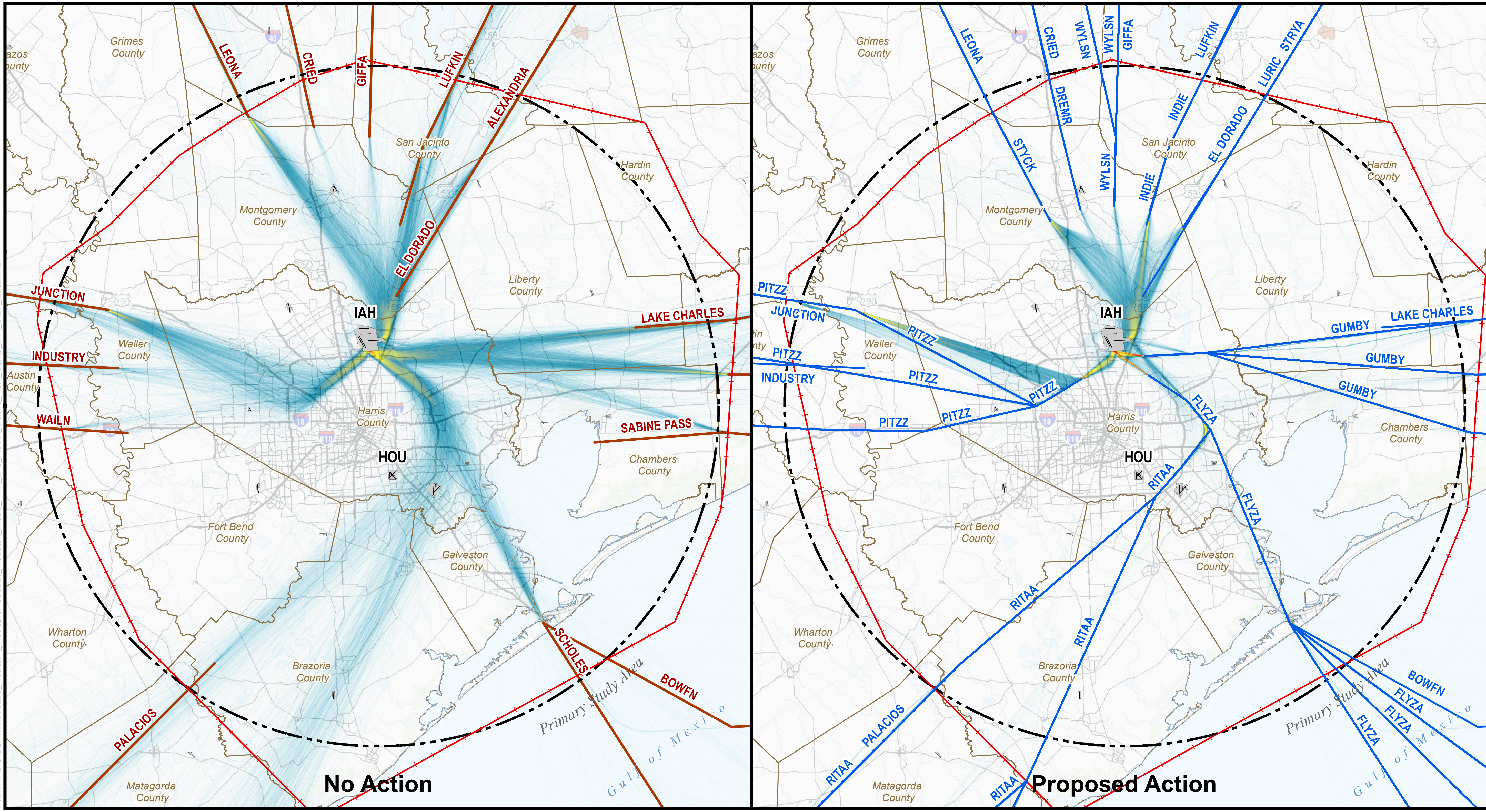
North

0 10 20 Nautical Miles

IAH Departures during West (Comparison of Proposed Action and No Action Alternatives)

Figure D-5

HARRIS MILLER MILLER & HANSON INC.



Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated)

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Primary Study Area

Core I90 TRACON Boundary

County/Parish Boundary

Alabama-Coushatta Tribe of Texas Reservation

Proposed Procedure

No Action Procedure

Flight Track Density

Low Medium High

Flight track depictions are annualized representations of 2014 conditions based on 36 24-hour periods in 2010-11.

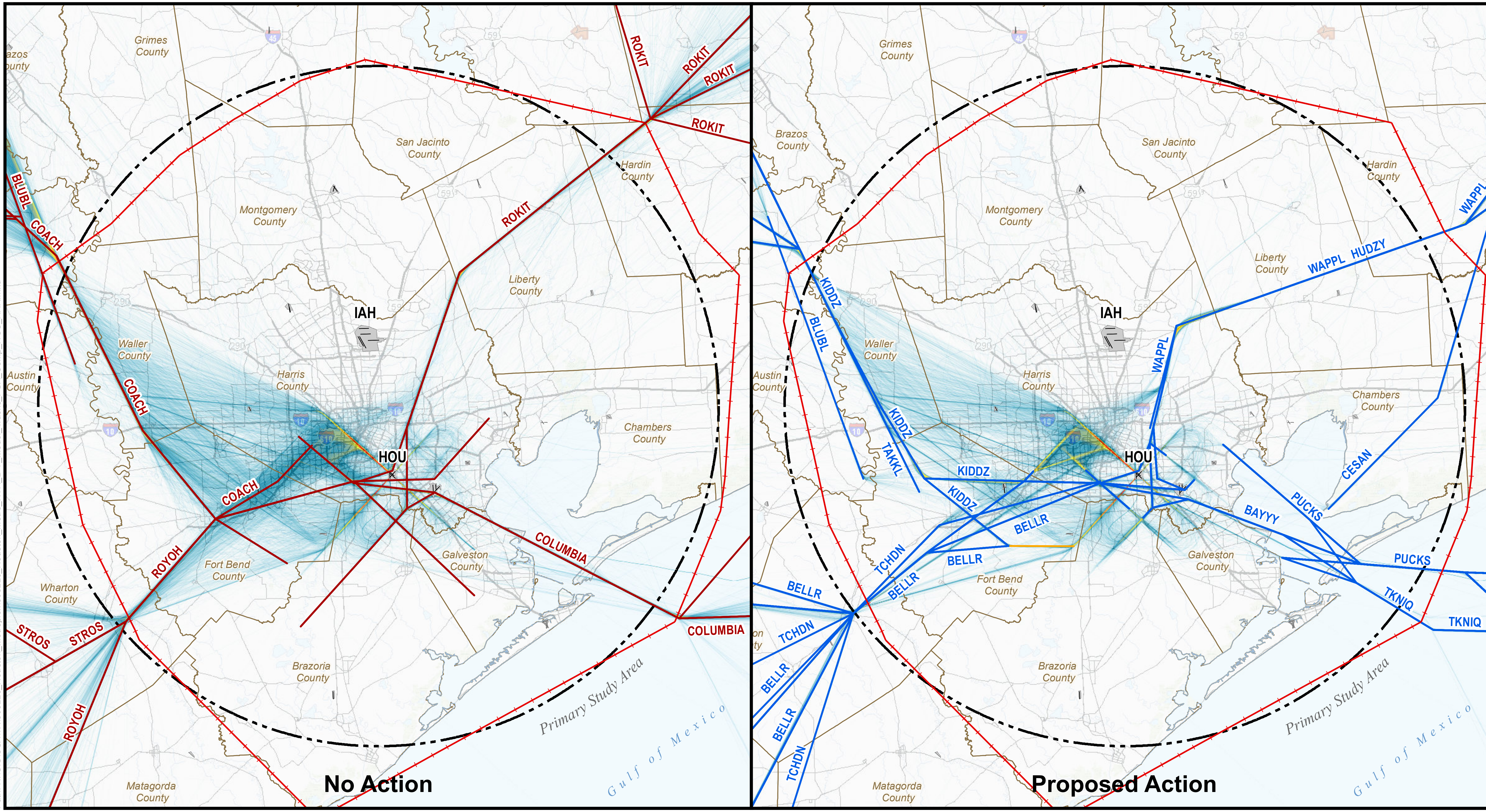
North

0 10 20 Nautical Miles

IAH Departures during East Flow (Comparison of Proposed Action and No Action Alternatives)

Figure D-6

HARRIS MILLER MILLER & HANSON INC.



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Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated)

Prepared By: Harris Miller Miller & Hanson Inc., January, 2013

Primary Study Area
Core I90 TRACON Boundary
County/Parish Boundary
Alabama-Coushatta Tribe of Texas Reservation

Proposed Procedure
No Action Procedure
Proposed RNP AR Approaches and RNAV Transitions (RNP AR and ILS)

Flight Track Density
Low Medium High

Flight track depictions are annualized representations of 2014 conditions based on 36 24-hour periods in 2010-11.

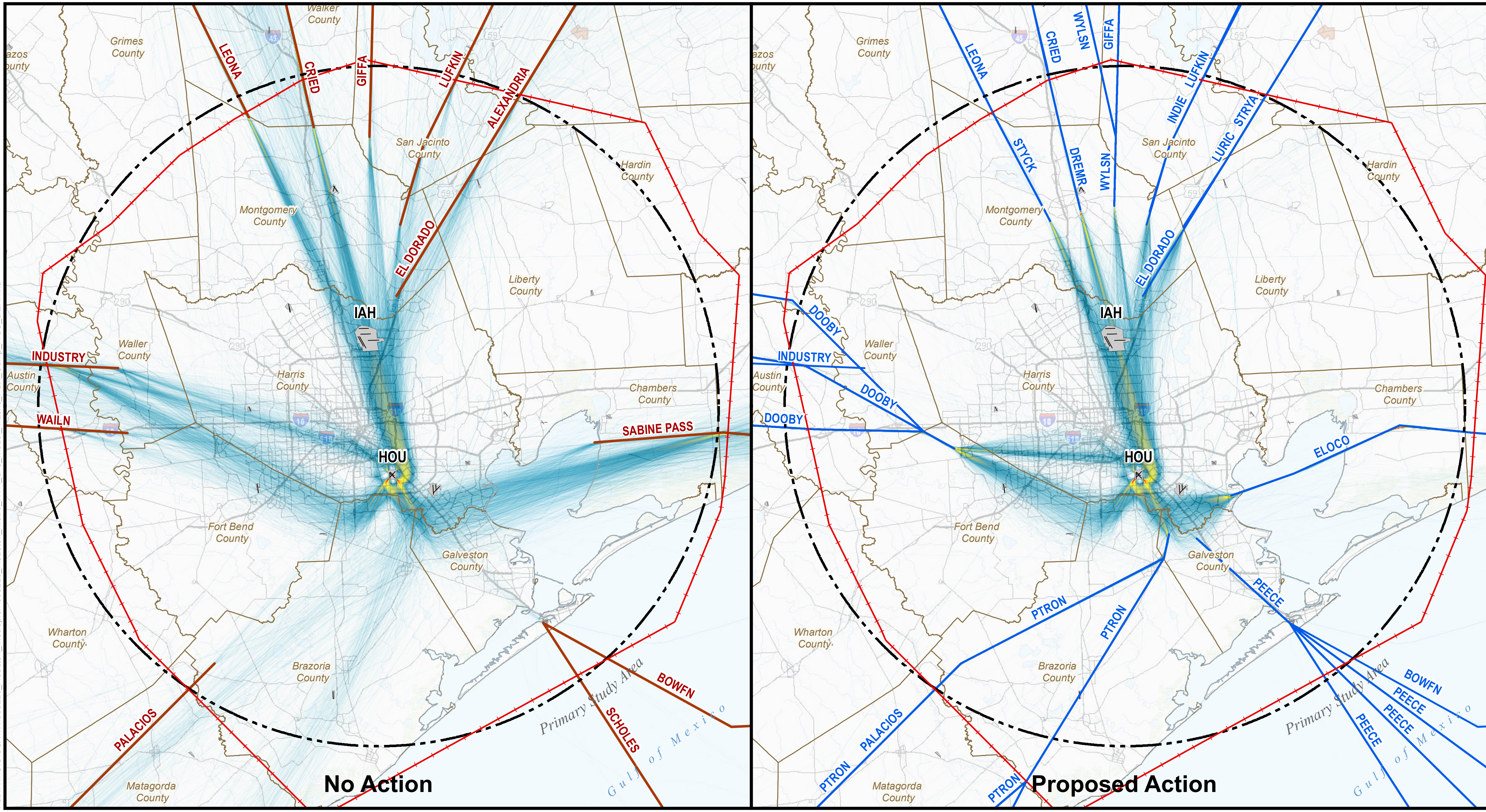
North

0 10 20 Nautical Miles

HOU Arrivals (Comparison of Proposed Action and No Action Alternatives)

Figure D-7

HARRIS MILLER MILLER & HANSON INC.



Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated)

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North

0 10 20 Nautical Miles

Primary Study Area

Supplemental Study Area

Core I90 TRACON Boundary

County/Parish Boundary

Alabama-Coushatta Tribe of Texas Reservation

Proposed Procedure

No Action Procedure

Flight Track Density

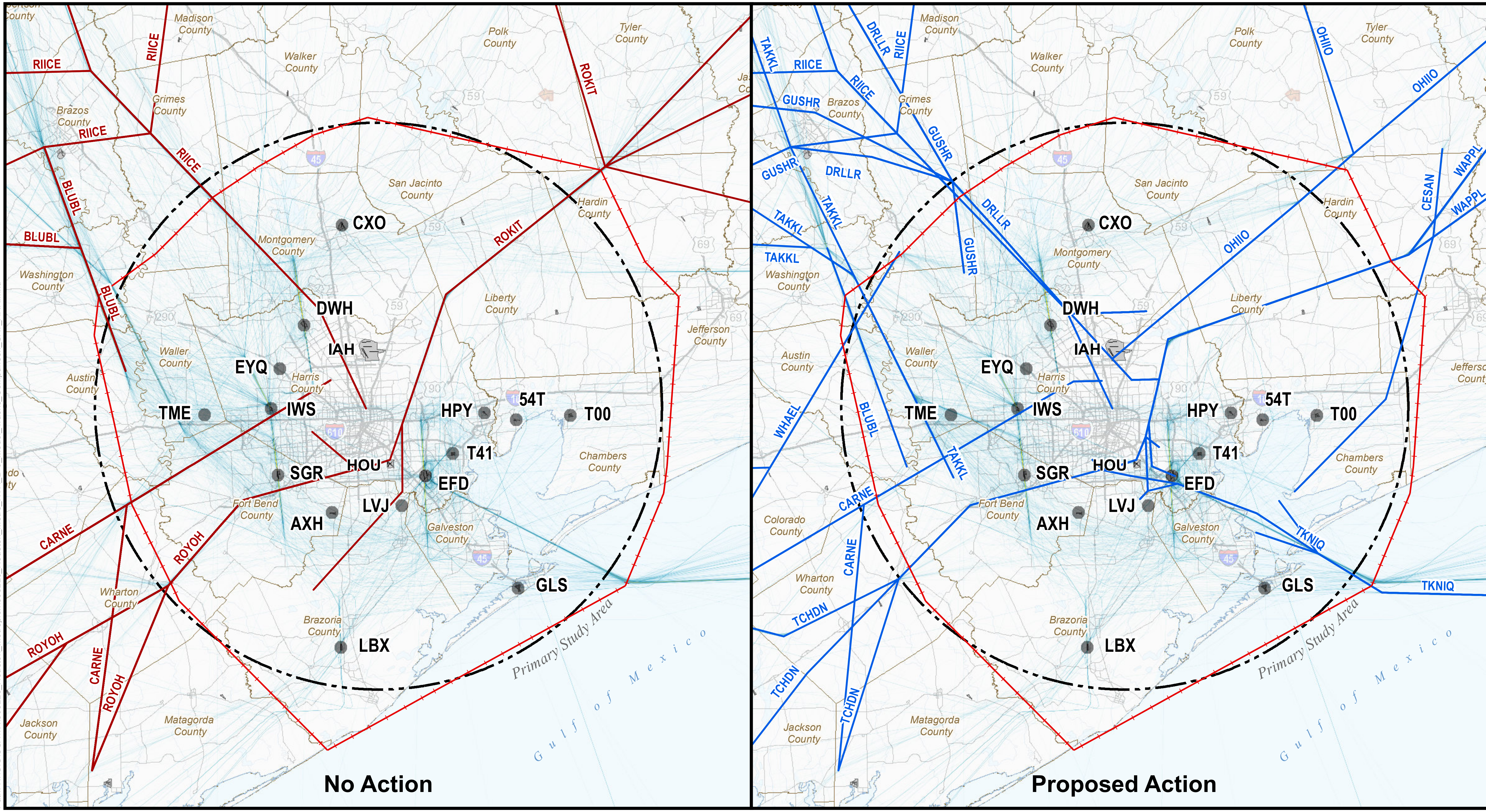
Low Medium High

Flight track depictions are annualized representations of 2014 conditions based on 36 24-hour periods in 2010-11.

HOU Departures (Comparison of Proposed Action and No Action Alternatives)

Figure D-8

HARRIS MILLER MILLER & HANSON INC.



Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated)

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Primary Study Area
Supplemental Study Area
Core I90 TRACON Boundary
County/Parish Boundary
Alabama-Coushatta Tribe of Texas Reservation

Proposed Procedure
No Action Procedure
Satellite Airports

Flight Track Density
Low Medium High

Flight track depictions are annualized representations of 2014 conditions based on 36 24-hour periods in 2010-11.

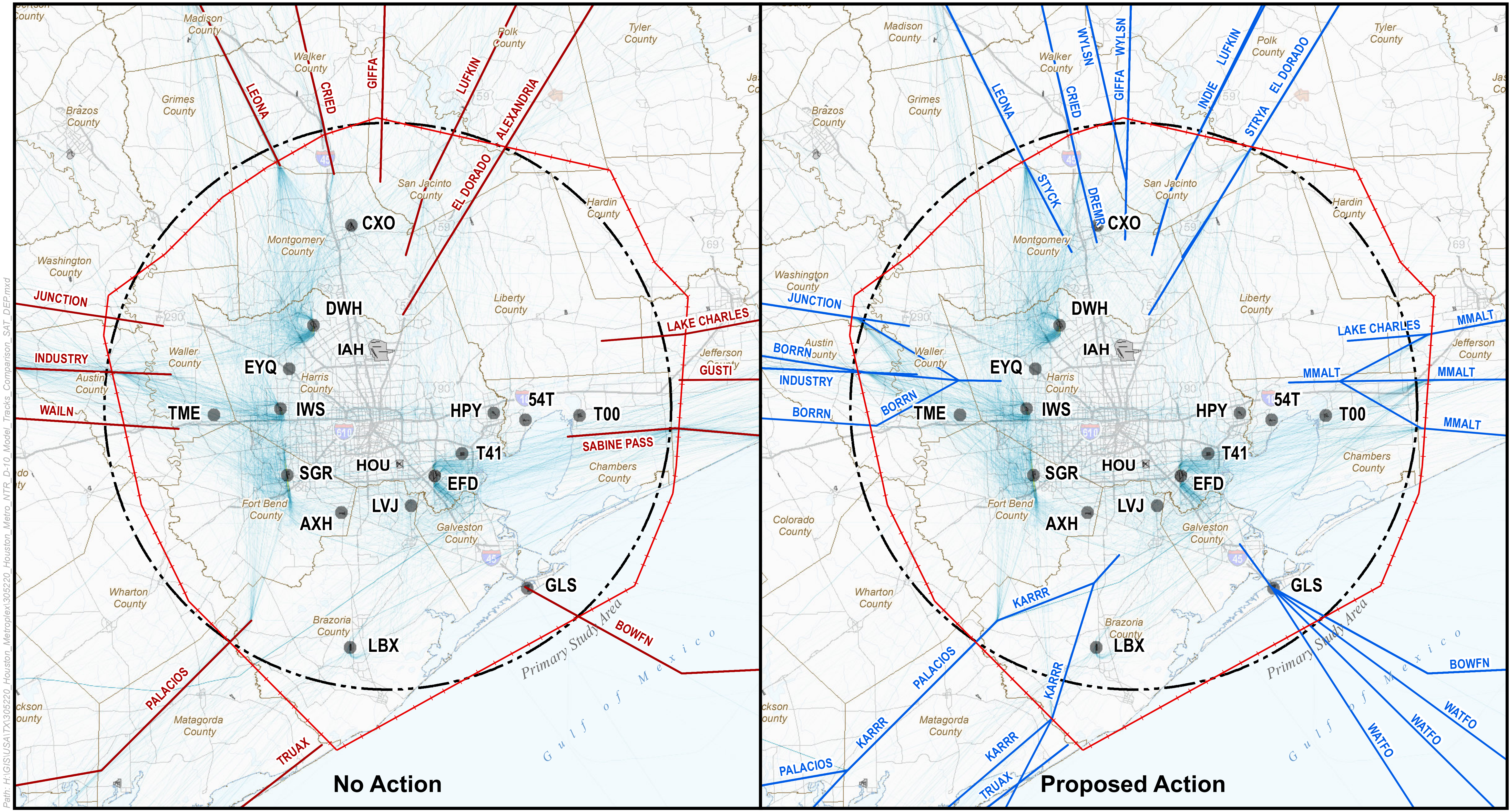
North

0 20 40 Nautical Miles

Satellite Airport Arrivals (Comparison of Proposed Action and No Action Alternatives)

Figure D-9

HARRIS MILLER MILLER & HANSON INC.



Data Source: Environmental Systems Research Institute, Inc.(ESRI) (Airport/Airport Runways), March 14, 2012; ESRI (State Boundaries/County Boundaries), February 14, 2012; ESRI (Cities), February 8, 2012; ESRI (Mountain Peaks), February 28, 2012; ESRI (Roads), March 14, 2012; Houston-Galveston Area Council (Water Features), March 14, 2012; National Atlas (Lakes/Rivers), September 10, 2012 (Updated)

Prepared By: Harris Miller Miller & Hanson Inc., January, 2013

North

0 20 40 Nautical Miles

Primary Study Area
Supplemental Study Area
Core I90 TRACON Boundary
County/Parish Boundary
Alabama-Coushatta Tribe of Texas Reservation
Proposed Procedure
No Action Procedure
Satellite Airports

Flight Track Density
Low Medium High

Flight track depictions are annualized representations of 2014 conditions based on 36 24-hour periods in 2010-11.

Satellite Airport Departures (Comparison of Proposed Action and No Action Alternatives)

Figure D-10

HARRIS MILLER MILLER & HANSON INC.

Appendix E Procedure Track Use Tables

IAH 2014 Arrivals Average Annual Day Operations by Route and Runway												
Side/Corner	Proposed Procedure	Procedure Type	Total	8L	8R	9	15L	15R	26L	26R	27	33L	33R
	No Change		44.48	4.93	7.36	0.78	0.45	0.80	13.08	6.20	10.88	0.00	0.00
Northeast	DOOBI	ILS*	72.79	0.00	0.00	0.00	0.00	0.00	72.79	0.00	0.00	0.00	0.00
Northeast	DOOBI	RNP**	5.30	0.00	0.00	0.00	0.00	0.00	5.30	0.00	0.00	0.00	0.00
Northeast	DOOBI	STAR	36.96	0.00	0.00	0.00	0.02	0.08	36.86	0.00	0.00	0.00	0.00
Northeast	OHIIO	Modification***	1.41	0.89	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northeast	OHIIO	STAR	10.64	1.33	0.36	0.00	0.00	0.00	6.77	1.69	0.48	0.00	0.00
Northeast	SKNRD	STAR	37.24	28.83	8.21	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northeast	TWSTD	RNP	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northeast	TWSTD	STAR	19.16	14.87	4.25	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Northeast	WHACK	ILS	50.32	0.00	0.00	0.00	0.00	0.00	0.00	9.76	40.56	0.00	0.00
Northeast	WHACK	RNP	11.27	0.00	0.00	0.00	0.00	0.00	0.00	1.64	9.63	0.00	0.00
Northeast	WHACK	STAR	6.47	0.00	0.00	0.00	0.00	0.00	5.81	0.48	0.18	0.00	0.00
Northwest	DRLLR	Modification	14.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.15	0.00	0.00
Northwest	DRLLR	RNP	10.62	0.00	0.00	0.00	0.00	0.00	3.90	6.29	0.44	0.00	0.00
Northwest	DRLLR	STAR	105.36	0.00	0.00	0.00	0.22	0.18	75.05	28.54	1.38	0.00	0.00
Northwest	GUSHR	ILS	13.08	13.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	GUSHR	RNP	1.84	1.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	GUSHR	STAR	40.58	9.34	30.54	0.66	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Northwest	MSCOT	Modification	4.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.18	0.00	0.00
Northwest	MSCOT	RNP	1.89	0.00	0.00	0.00	0.00	0.00	0.64	1.20	0.05	0.00	0.00
Northwest	MSCOT	STAR	20.62	0.00	0.00	0.00	0.02	0.03	15.17	5.17		0.00	0.00
Northwest	RIICE	STAR	0.89	0.21	0.08	0.00	0.01	0.00	0.31	0.28	0.01	0.00	0.00
Northwest	TTORO	ILS	5.69	0.00	5.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	TTORO	RNP	1.12	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	TTORO	STAR	4.18	4.14	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Southeast	BOOZZ	ILS	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00
Southeast	BOOZZ	STAR	0.10	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southeast	BRSKT	RNP	4.11	0.00	3.76	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southeast	BRSKT	STAR	32.00	0.26	27.75	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southeast	GILCO	STAR	1.16	0.09	0.26	0.00	0.00	0.00	0.37	0.40	0.04	0.00	0.00
Southeast	GILLL	ILS	44.37	0.00	0.00	0.00	0.00	0.00	10.34	0.00	34.03	0.00	0.00
Southeast	GILLL	RNP	3.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.68	0.00	0.00

Side/Corner	Proposed Procedure	Procedure Type	Total	8L	8R	9	15L	15R	26L	26R	27	33L	33R
Southeast	GILLL	STAR	73.11	0.00	0.00	0.00	0.00	0.00	8.04	0.14	64.93	0.00	0.01
Southwest	CARNE	STAR	8.61	0.11	3.07	0.25	0.03	0.00	2.06	0.00	3.08	0.00	0.00
Southwest	HTOWN	ILS	17.62	0.00	17.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southwest	HTOWN	RNP	3.16	0.00	3.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southwest	HTOWN	STAR	25.71	0.33	21.43	3.90	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Southwest	TEJAS	RNP	4.83	0.00	0.00	0.00	0.00	0.00	0.00	0.03	4.80	0.00	0.00
Southwest	TEJAS	STAR	91.66	0.00	0.00	0.00	0.00	0.04	14.36	0.35	76.89	0.00	0.01
Arrivals Totals			**830.93**	**80.25**	**135.19**	**10.31**	**0.76**	**1.25**	**270.85**	**62.14**	**269.92**	**0.00**	**0.02**

Note: Totals and subtotals may not match exactly due to rounding

*ILS implies a STAR connected to a ILS RNAV transition

**RNP implies as STAR connected in a RNP AR transition

***Modification notes any adjustment made to the procedure during the course of modeling. These include shortcuts and non-typical operations that were discussed with Design and Implementation Team

IAH 2014 Departures Average Annual Day Operations by Route and Runway													
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**8L**	**8R**	**9**	**15L**	**15R**	**26L**	**26R**	**27**	**33L**	**33R**
	No Change		35.87	0.00	0.33	2.53	19.12	9.58	1.39	0.56	0.30	0.77	1.28
East	GUMBY	Modification*	4.94	0.00	0.00	4.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
East	GUMBY	SID	68.18	0.00	0.03	3.11	53.89	10.54	0.00	0.00	0.00	0.46	0.16
East	MMUGS	Modification	13.14	0.00	0.00	0.00	12.60	0.54	0.00	0.00	0.00	0.00	0.00
East	MMUGS	SID	111.10	0.00	0.00	0.00	93.37	3.68	0.40	0.02	2.26	7.62	3.74
North	DREMR	SID	13.56	0.00	0.16	2.17	4.32	4.24	0.97	0.51	0.16	0.19	0.85
North	INDIE	SID	109.23	0.00	1.88	20.07	32.12	39.05	4.21	1.46	0.64	2.03	7.77
North	LURIC	SID	52.09	0.00	0.77	9.76	15.80	18.14	1.57	1.19	0.13	1.36	3.39
North	STRYA	SID	12.15	0.00	0.36	1.80	4.25	3.52	0.90	0.16	0.07	0.18	0.91
North	STYCK	SID	115.42	0.00	1.90	21.57	28.31	39.54	10.09	3.35	0.85	2.17	7.62
North	WYLSN	SID	22.32	0.00	0.23	3.48	6.80	7.23	1.78	0.75	0.13	0.46	1.47
South	FLYZA	SID	41.96	0.00	0.00	2.41	34.28	2.57	0.09	0.00	0.58	1.23	0.80
South	RITAA	Modification	3.86	0.00	0.00	0.00	2.64	0.97	0.03	0.00	0.09	0.06	0.07
South	RITAA	SID	89.93	0.00	0.00	2.51	75.66	6.80	0.06	0.01	1.19	2.71	0.98
West	BNDTO	Modification	14.11	0.00	0.00	0.00	5.63	8.48	0.00	0.00	0.00	0.00	0.00
West	BNDTO	SID	74.26	0.00	0.00	0.00	27.20	35.28	1.14	0.00	1.31	6.99	2.34
West	PITZZ	Modification	31.97	0.00	0.00	0.00	13.59	18.38	0.00	0.00	0.00	0.00	0.00
West	PITZZ	SID	16.84	0.00	0.00	0.09	6.68	9.53	0.00	0.00	0.00	0.24	0.30
Departures Totals			**830.93**	**0.00**	**5.65**	**83.42**	**436.27**	**218.07**	**22.64**	**8.01**	**34.71**	**26.47**	**31.69**
Note: Totals and subtotals may not match exactly due to rounding													
*Modification notes any adjustment made to the procedure during the course of modeling. These include shortcuts and non-typical operations that were discussed with Design and Implementation Team													

IAH 2019 Arrivals Average Annual Day Operations by Route and Runway													
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**8L**	**8R**	**9**	**15L**	**15R**	**26L**	**26R**	**27**	**33L**	**33R**
	No Change		47.78	5.01	8.29	0.78	0.48	0.84	13.45	6.25	12.66	0.00	0.00
Northeast	DOOBI	ILS*	72.89	0.00	0.00	0.00	0.00	0.00	72.89	0.00	0.00	0.00	0.00
Northeast	DOOBI	RNP**	68.24	0.00	0.00	0.00	0.00	0.00	68.24	0.00	0.00	0.00	0.00
Northeast	DOOBI	STAR	0.10	0.00	0.00	0.00	0.02	0.08	0.00	0.00	0.00	0.00	0.00
Northeast	OHIIO	Modification***	1.43	0.90	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northeast	OHIIO	STAR	10.82	1.35	0.37	0.00	0.00	0.00	6.90	1.72	0.48	0.00	0.00
Northeast	SKNRD	RNP	0.14	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northeast	SKNRD	STAR	50.40	38.84	11.46	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northeast	TWSTD	RNP	0.05	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northeast	TWSTD	STAR	21.77	16.92	4.83	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Northeast	WHACK	ILS	46.34	0.00	0.00	0.00	0.00	0.00	0.00	7.67	38.68	0.00	0.00
Northeast	WHACK	RNP	38.81	0.00	0.00	0.00	0.00	0.00	0.00	7.36	31.45	0.00	0.00
Northeast	WHACK	STAR	6.50	0.00	0.00	0.00	0.00	0.00	6.50	0.00	0.00	0.00	0.00
Northwest	DRLLR	Modification	16.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.17	0.00	0.00
Northwest	DRLLR	RNP	75.24	0.00	0.00	0.00	0.00	0.00	45.75	26.52	2.97	0.00	0.00
Northwest	DRLLR	STAR	61.63	0.00	0.00	0.00	0.24	0.19	45.05	13.47	2.68	0.00	0.00
Northwest	GUSHR	ILS	9.48	9.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	GUSHR	RNP	7.96	7.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	GUSHR	STAR	48.23	10.74	36.68	0.76	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Northwest	MSCOT	Modification	5.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.34	0.00	0.00
Northwest	MSCOT	RNP	14.97	0.00	0.00	0.00	0.00	0.00	9.39	5.40		0.00	0.00
Northwest	MSCOT	STAR	10.33	0.00	0.00	0.00	0.02	0.03	8.18	1.64	0.46	0.00	0.00
Northwest	RIICE	STAR	0.94	0.21	0.09	0.00	0.01	0.00	0.33	0.29	0.01	0.00	0.00
Northwest	TTORO	ILS	4.21	0.00	4.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	TTORO	RNP	4.51	0.00	4.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	TTORO	STAR	4.84	4.80	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Southeast	BOOZZ	ILS	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00
Southeast	BOOZZ	STAR	0.11	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southeast	BRSKT	RNP	19.96	0.00	16.19	3.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southeast	BRSKT	STAR	21.70	0.29	20.19	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southeast	GILCO	STAR	1.18	0.09	0.28	0.00	0.00	0.00	0.37	0.40	0.04	0.00	0.00
Southeast	GILLL	ILS	33.15	0.00	0.00	0.00	0.00	0.00	11.93	0.00	21.21	0.00	0.00

Side/Corner	Proposed Procedure	Procedure Type	Total	8L	8R	9	15L	15R	26L	26R	27	33L	33R
Southeast	GILLL	RNP	22.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.59	0.00	0.00
Southeast	GILLL	STAR	84.30	0.00	0.00	0.00	0.00	0.00	9.17	0.16	74.96	0.00	0.01
Southwest	CARNE	STAR	9.06	0.12	3.13	0.27	0.03	0.00	2.25	0.00	3.27	0.00	0.00
Southwest	HTOWN	ILS	13.44	0.00	13.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southwest	HTOWN	RNP	10.22	0.00	10.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southwest	HTOWN	STAR	28.82	0.25	24.10	4.42	0.00	0.06	0.00	0.00	0.00	0.00	0.00
Southwest	TEJAS	RNP	51.45	0.00	0.00	0.00	0.00	0.00	0.00	0.19	51.25	0.00	0.00
Southwest	TEJAS	STAR	57.21	0.00	0.00	0.00	0.00	0.00	15.93	0.16	41.11	0.00	0.01
Totals			**982.91**	**96.97**	**158.50**	**11.67**	**0.81**	**1.26**	**316.34**	**71.24**	**325.91**	**0.00**	**0.02**

Note: Totals and subtotals may not match exactly due to rounding

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**RNP implies as STAR connected in a RNP AR transition

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IAH 2019 Departures Average Annual Day Operations by Route and Runway													
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**8L**	**8R**	**9**	**15L**	**15R**	**26L**	**26R**	**27**	**33L**	**33R**
	No Change		38.09	0.00	0.36	2.67	20.66	9.88	1.46	0.57	0.32	0.81	1.36
East	GUMBY	Modification	6.41	0.00	0.00	6.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
East	GUMBY	SID	81.05	0.00	0.00	4.74	63.33	12.30	0.00	0.00	0.00	0.50	0.17
East	MMUGS	Modification	15.16	0.00	0.00	0.00	14.54	0.62	0.00	0.00	0.00	0.00	0.00
East	MMUGS	SID	134.29	0.00	0.00	0.00	113.28	4.33	0.43	0.02	2.59	9.11	4.52
North	DREMR	SID	22.71	0.00	0.25	4.02	5.91	7.18	2.11	0.89	0.21	0.36	1.77
North	INDIE	SID	140.24	0.00	2.48	27.04	45.74	45.33	4.83	1.63	0.73	2.31	10.14
North	LURIC	SID	69.39	0.00	0.87	12.59	24.76	21.11	1.99	1.36	0.16	1.77	4.78
North	STRYA	SID	14.08	0.00	0.41	2.34	4.62	3.83	1.11	0.18	0.07	0.21	1.31
North	STYCK	SID	137.09	0.00	2.15	26.02	35.63	45.38	11.37	3.80	1.21	2.48	9.03
North	WYLSN	SID	18.42	0.00	0.18	2.47	7.22	5.69	0.97	0.58	0.13	0.34	0.85
South	FLYZA	SID	47.12	0.00	0.00	2.67	38.54	2.89	0.10	0.00	0.65	1.37	0.89
South	RITAA	Modification	4.35	0.00	0.00	0.00	2.95	1.11	0.03	0.00	0.09	0.08	0.08
South	RITAA	SID	101.42	0.00	0.00	2.82	85.42	7.59	0.07	0.01	1.31	3.10	1.10
West	BNDTO	Modification	15.62	0.00	0.00	0.00	6.23	9.38	0.00	0.00	0.00	0.00	0.00
West	BNDTO	SID	82.82	0.00	0.00	0.00	30.65	39.13	1.25	0.00	1.44	7.76	2.59
West	PITZZ	Modification	35.79	0.00	0.00	0.00	15.27	20.52	0.00	0.00	0.00	0.00	0.00
West	PITZZ	SID	18.87	0.00	0.00	0.09	7.73	10.46	0.00	0.00	0.00	0.27	0.32
Totals			**982.91**	**0.00**	**6.71**	**93.90**	**522.50**	**246.73**	**25.72**	**9.04**	**8.91**	**30.48**	**38.92**

Note: Totals and subtotals may not match exactly due to rounding

*Modification notes any adjustment made to the procedure during the course of modeling. These include shortcuts and non-typical operations that were discussed with Design and Implementation Team

HOU 2014 Arrivals Average Annual Day Operations by Route and Runway											
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**4**	**12L**	**12R**	**17**	**22**	**30L**	**30R**	**35**
	No Change		18.29	6.20	1.74	7.05	1.14	0.43	0.76	0.07	0.91
Northeast	CESAN	STAR	2.25	0.71	0.47	0.34	0.18	0.08	0.30	0.13	0.04
Northeast	HUDZY	Modification*	0.90	0.33	0.04	0.43	0.00	0.09	0.00	0.00	0.00
Northeast	WAPPL	Modification	11.77	0.00	0.00	11.77	0.00	0.00	0.00	0.00	0.00
Northeast	WAPPL	STAR	40.70	12.41	0.41	20.62	0.46	2.28	4.45	0.00	0.08
Northwest	BLUBL	STAR	6.56	1.59	1.85	1.80	0.37	0.23	0.23	0.12	0.37
Northwest	KIDDZ	ILS**	8.56	8.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	KIDDZ	Modification	48.96	16.01	0.20	24.85	0.60	2.30	4.96	0.01	0.02
Northwest	KIDDZ	STAR	39.32	0.00	0.36	33.37	0.61	1.68	3.17	0.00	0.13
Northwest	TAKKL	STAR	0.63	0.14	0.06	0.25	0.00	0.09	0.08	0.00	0.02
Southeast	BAYYY	STAR	28.88	7.52	0.20	21.17	0.00	0.00	0.00	0.00	0.00
Southeast	PUCKS	STAR	4.35	0.00	0.00	0.00	0.00	1.32	3.03	0.01	0.00
Southeast	TKNIQ	STAR	1.98	0.49	0.31	0.66	0.09	0.07	0.25	0.03	0.07
Southwest	BELLR	ILS	4.43	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southwest	BELLR	Modification	9.64	3.72	0.00	5.92	0.00	0.00	0.00	0.00	0.00
Southwest	BELLR	STAR	16.78	0.00	0.27	13.20	0.20	1.11	1.97	0.01	0.02
Southwest	TCHDN	STAR	8.30	1.77	2.07	3.41	0.25	0.30	0.39	0.05	0.05
Totals			**252.29**	**63.88**	**7.98**	**144.83**	**3.90**	**9.96**	**19.59**	**0.44**	**1.71**
Note: Totals and subtotals may not match exactly due to rounding											
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**ILS implies a STAR connected to a ILS RNAV transition											

HOU 2014 Departures Average Annual Day Operations by Route and Runway											
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**4**	**12L**	**12R**	**17**	**22**	**30L**	**30R**	**35**
	No Change		14.83	0.86	0.31	4.62	0.45	6.17	1.12	0.83	0.48
East	ELOCO	SID	53.51	2.66	0.20	21.60	0.70	24.36	3.47	0.30	0.23
North	DREMR	SID	31.50	1.50	0.13	16.10	0.41	9.67	2.35	0.51	0.83
North	INDIE	SID	15.64	1.01	0.13	6.79	0.10	6.07	0.71	0.39	0.44
North	LURIC	SID	13.16	0.72	0.04	6.30	0.13	4.73	0.85	0.10	0.27
North	STRYA	SID	6.96	0.51	0.05	2.96	0.03	2.58	0.62	0.10	0.11
North	STYCK	SID	24.74	2.05	0.08	10.28	0.39	9.24	1.66	0.44	0.61
North	WYLSN	SID	12.47	0.64	0.04	2.94	0.43	7.39	0.83	0.08	0.12
South	PEECE	SID	1.24	0.02	0.00	0.48	0.06	0.64	0.03	0.01	0.01
South	PTRON	SID	22.06	0.63	0.24	9.22	0.26	9.54	1.24	0.65	0.28
West	DOBBY	SID	56.17	2.71	0.19	19.62	1.27	25.87	3.91	1.37	1.23
Totals			**252.29**	**13.31**	**1.42**	**100.91**	**4.22**	**106.25**	**16.79**	**4.77**	**4.62**
Note: Totals and subtotals may not match exactly due to rounding											

HOU 2019 Arrivals Average Annual Day Operations by Route and Runway											
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**4**	**12L**	**12R**	**17**	**22**	**30L**	**30R**	**35**
	No Change		19.40	6.77	1.74	7.37	1.25	0.47	0.79	0.07	0.93
Northeast	CESAN	STAR	2.33	0.72	0.48	0.36	0.18	0.08	0.32	0.14	0.04
Northeast	HUDZY	Modification*	0.79	0.33	0.04	0.42	0.00	0.00	0.00	0.00	0.00
Northeast	WAPPL	Modification	13.85	0.00	0.00	13.85	0.00	0.00	0.00	0.00	0.00
Northeast	WAPPL	STAR	46.15	14.25	0.40	23.45	0.19	2.63	5.14	0.00	0.09
Northwest	BLUBL	STAR	6.81	1.66	1.90	1.89	0.38	0.24	0.22	0.13	0.39
Northwest	KIDDZ	ILS**	10.17	10.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northwest	KIDDZ	Modification	56.12	18.39	0.23	28.51	0.69	2.58	5.71	0.01	0.01
Northwest	KIDDZ	STAR	45.86	0.00	0.40	39.09	0.72	1.89	3.58	0.00	0.16
Northwest	TAKKL	STAR	0.68	0.15	0.06	0.27	0.00	0.10	0.08	0.00	0.03
Southeast	BAYYY	STAR	43.55	12.57	0.24	30.74	0.00	0.00	0.00	0.00	0.00
Southeast	PUCKS	STAR	7.18	0.00	0.00	0.00	0.00	2.02	5.16	0.01	0.00
Southeast	TKNIQ	STAR	2.19	0.54	0.35	0.73	0.09	0.10	0.28	0.03	0.07
Southwest	BELLR	ILS	6.40	6.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southwest	BELLR	Modification	15.22	6.27	0.00	8.95	0.00	0.00	0.00	0.00	0.00
Southwest	BELLR	STAR	24.19	0.00	0.29	19.20	0.21	1.78	2.68	0.02	0.02
Southwest	TCHDN	STAR	8.66	1.85	2.17	3.56	0.27	0.29	0.41	0.05	0.06
Totals			**309.55**	**80.06**	**8.30**	**178.38**	**3.99**	**12.18**	**24.38**	**0.46**	**1.79**
Note: Totals and subtotals may not match exactly due to rounding											
* Modification notes any adjustment made to the procedure during the course of modeling. These include shortcuts and non-typical operations that were discussed with Design and Implementation Team											
**ILS implies a STAR connected to a ILS RNAV transition											

HOU 2019 Departures Average Annual Day Operations by Route and Runway											
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**4**	**12L**	**12R**	**17**	**22**	**30L**	**30R**	**35**
	No Change		15.84	0.89	0.31	5.16	0.46	6.62	1.11	0.81	0.48
East	ELOCO	SID	82.99	3.85	0.28	36.53	0.76	35.53	5.47	0.32	0.25
North	DREMR	SID	17.89	1.28	0.05	4.89	0.19	9.61	1.25	0.29	0.33
North	INDIE	SID	18.10	1.07	0.14	8.17	0.10	6.91	0.83	0.42	0.46
North	LURIC	SID	15.75	0.80	0.05	7.69	0.14	5.68	0.99	0.11	0.30
North	STRYA	SID	8.01	0.61	0.05	3.44	0.03	2.91	0.73	0.11	0.12
North	STYCK	SID	28.26	2.27	0.09	12.11	0.45	10.29	1.91	0.47	0.67
North	WYLSN	SID	31.48	1.05	0.14	16.97	0.73	9.39	2.16	0.35	0.69
South	PEECE	SID	1.32	0.02	0.00	0.52	0.06	0.67	0.03	0.01	0.01
South	PTRON	SID	24.32	0.74	0.25	10.40	0.26	10.30	1.38	0.69	0.29
West	DOBBY	SID	65.58	3.13	0.19	23.42	1.35	30.08	4.64	1.45	1.32
Totals			**309.55**	**15.72**	**1.56**	**129.30**	**4.54**	**128.01**	**20.49**	**5.02**	**4.92**
Note: Totals and subtotals may not match exactly due to rounding											

DWH 2014 Average Annual Day Operations by Route and Runway							
Side/Corner	Proposed Procedure	Procedure Type	Total	17L	17R	35L	35R
	No Change		11.80	0.14	7.84	3.74	0.09
Northeast	OHIIO	STAR	6.31	0.06	4.29	1.96	0.00
Northwest	DRLLR	STAR	3.33	0.00	1.62	1.65	0.06
Northwest	GUSHR	STAR	2.01	0.00	1.39	0.62	0.00
Northwest	RIICE	STAR	4.08	0.00	2.81	1.22	0.05
Southwest	CARNE	STAR	0.09	0.00	0.07	0.02	0.00
Southwest	WHAEL	STAR	3.67	0.00	1.89	1.72	0.05
Arrivals Totals			**31.28**	**0.19**	**19.91**	**10.92**	**0.25**
	No Change		11.07	0.00	8.14	2.93	0.00
East	MMALT	SID	1.85	0.00	1.40	0.45	0.00
North	DREMR	SID	1.92	0.00	1.16	0.76	0.00
North	INDIE	SID	1.99	0.00	1.15	0.84	0.00
North	LURIC	SID	0.84	0.00	0.63	0.21	0.00
North	STRYA	SID	1.22	0.00	0.91	0.31	0.00
North	STYCK	SID	4.27	0.00	3.41	0.86	0.00
North	WYLSN	SID	0.91	0.00	0.81	0.10	0.00
South	KARRR	SID	1.90	0.05	0.84	0.84	0.17
West	BORRN	SID	5.31	0.00	3.72	1.59	0.00
Departures Totals			**31.28**	**0.05**	**22.17**	**8.90**	**0.17**
Note: Totals and subtotals may not match exactly due to rounding							

DWH 2019 Average Annual Day Operations by Route and Runway							
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**17L**	**17R**	**35L**	**35R**
	No Change		12.14	0.14	8.07	3.82	0.10
Northeast	OHIIO	STAR	6.60	0.06	4.38	2.16	0.00
Northwest	DRLLR	STAR	3.50	0.00	1.73	1.70	0.07
Northwest	GUSHR	STAR	1.98	0.00	1.51	0.47	0.00
Northwest	RIICE	STAR	4.37	0.00	2.99	1.32	0.06
Southwest	CARNE	STAR	0.10	0.00	0.07	0.03	0.00
Southwest	WHAEL	STAR	3.93	0.00	2.02	1.85	0.05
Arrivals Totals			**32.61**	**0.20**	**20.77**	**11.36**	**0.29**
	No Change		11.79	0.00	8.64	3.15	0.00
East	MMALT	SID	1.93	0.00	1.46	0.47	0.00
North	DREMR	SID	1.38	0.00	1.04	0.33	0.00
North	INDIE	SID	2.02	0.00	1.18	0.84	0.00
North	LURIC	SID	0.77	0.00	0.58	0.19	0.00
North	STRYA	SID	1.32	0.00	0.98	0.34	0.00
North	STYCK	SID	4.22	0.00	3.46	0.77	0.00
North	WYLSN	SID	1.62	0.00	1.05	0.57	0.00
South	KARRR	SID	1.97	0.05	0.86	0.87	0.20
West	BORRN	SID	5.59	0.00	3.90	1.69	0.00
Departures Totals			**32.61**	**0.05**	**23.15**	**9.22**	**0.20**
Note: Totals and subtotals may not match exactly due to rounding							

EFD 2014 Average Annual Day Operations by Route and Runway							
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**17L**	**17R**	**35L**	**35R**
	No Change		16.90	1.66	8.00	1.12	6.13
Northeast	CESAN	STAR	0.79	0.06	0.33	0.10	0.29
Northeast	WAPPL	STAR	2.90	0.22	1.36	0.27	1.04
Northwest	BLUBL	STAR	0.98	0.06	0.49	0.11	0.31
Northwest	TAKKL	STAR	6.25	0.41	2.70	0.49	2.64
Southeast	TKNIQ	STAR	0.37	0.05	0.22	0.00	0.10
Southwest	TCHDN	STAR	1.37	0.08	0.82	0.00	0.48
Arrivals Totals			**29.55**	**2.55**	**13.93**	**2.10**	**10.98**
	No Change		7.82	0.60	3.84	0.48	2.91
East	MMALT	SID	4.50	0.41	2.33	0.09	1.67
North	DREMR	SID	1.71	0.52	0.52	0.09	0.58
North	INDIE	SID	2.23	0.45	0.87	0.06	0.86
North	LURIC	SID	1.38	0.08	0.63	0.04	0.64
North	STRYA	SID	0.78	0.30	0.11	0.24	0.13
North	STYCK	SID	1.57	0.25	0.56	0.18	0.58
North	WYLSN	SID	0.36	0.00	0.19	0.00	0.17
South	KARRR	SID	3.22	0.00	0.78	0.29	2.15
South	WATFO	SID	0.10	0.00	0.00	0.00	0.10
West	BORRN	SID	5.90	1.12	2.03	0.63	2.11
Departures Totals			**29.55**	**3.72**	**11.85**	**2.09**	**11.89**
Note: Totals and subtotals may not match exactly due to rounding							

EFD 2019 Average Annual Day Operations by Route and Runway							
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**17L**	**17R**	**35L**	**35R**
	No Change		16.90	1.66	8.00	1.12	6.13
Northeast	CESAN	STAR	0.79	0.06	0.33	0.10	0.29
Northeast	WAPPL	STAR	2.90	0.22	1.36	0.27	1.04
Northwest	BLUBL	STAR	0.98	0.06	0.49	0.11	0.31
Northwest	TAKKL	STAR	6.25	0.41	2.70	0.49	2.64
Southeast	TKNIQ	STAR	0.37	0.05	0.22	0.00	0.10
Southwest	TCHDN	STAR	1.37	0.08	0.82	0.00	0.48
Arrivals Totals			**29.55**	**2.55**	**13.93**	**2.10**	**10.98**
	No Change		8.02	0.70	3.84	0.48	3.01
East	MMALT	SID	4.50	0.41	2.33	0.09	1.67
North	DREMR	SID	1.45	0.36	0.48	0.08	0.53
North	INDIE	SID	2.23	0.45	0.87	0.06	0.86
North	LURIC	SID	1.38	0.08	0.63	0.04	0.64
North	STRYA	SID	0.78	0.30	0.11	0.24	0.13
North	STYCK	SID	1.57	0.25	0.56	0.18	0.58
North	WYLSN	SID	0.62	0.16	0.23	0.01	0.22
South	KARRR	SID	3.22	0.00	0.78	0.29	2.15
South	WATFO	SID	0.10	0.00	0.00	0.00	0.10
West	BORRN	SID	5.70	1.02	2.03	0.63	2.01
Departures Totals			**29.55**	**3.72**	**11.85**	**2.09**	**11.89**
Note: Totals and subtotals may not match exactly due to rounding							

IWS 2014 Average Annual Day Operations by Route and Runway					
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**15**	**33**
	No Change		11.06	9.94	1.12
Northeast	CESAN	STAR	0.75	0.66	0.09
Northeast	WAPPL	STAR	0.27	0.27	0.00
Northwest	BLUBL	STAR	4.97	4.66	0.31
Northwest	TAKKL	STAR	0.69	0.46	0.23
Southeast	TKNIQ	STAR	1.45	0.00	1.45
Southwest	TCHDN	STAR	0.30	0.17	0.13
Arrivals Totals			**19.48**	**16.15**	**3.33**
	No Change		12.89	9.09	3.80
East	MMALT	SID	1.58	1.23	0.35
North	DREMR	SID	0.23	0.12	0.11
North	INDIE	SID	1.16	0.72	0.43
North	STRYA	SID	0.11	0.08	0.03
North	STYCK	SID	2.06	1.01	1.04
South	KARRR	SID	1.46	0.96	0.50
Departures Totals			**19.48**	**13.22**	**6.26**
Note: Totals and subtotals may not match exactly due to rounding					

IWS 2019 Average Annual Day Operations by Route and Runway					
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**15**	**33**
	No Change		11.96	10.79	1.17
Northeast	CESAN	STAR	0.80	0.69	0.11
Northeast	WAPPL	STAR	0.27	0.27	0.00
Northwest	BLUBL	STAR	5.23	4.92	0.31
Northwest	TAKKL	STAR	0.76	0.51	0.25
Southwest	TCHDN	STAR	0.32	0.17	0.15
Southeast	TKNIQ	STAR	1.57	0.00	1.57
Arrivals Totals			**20.90**	**17.35**	**3.55**
	No Change		14.06	9.76	4.30
East	MMALT	SID	1.62	1.27	0.35
North	DREMR	SID	0.23	0.12	0.11
North	INDIE	SID	1.16	0.72	0.43
North	STRYA	SID	0.11	0.08	0.03
North	STYCK	SID	2.22	1.09	1.13
South	KARRR	SID	1.51	1.00	0.50
Departures Totals			**20.90**	**14.05**	**6.86**
Note: Totals and subtotals may not match exactly due to rounding					

LBX 2014 Average Annual Day Operations by Route and Runway					
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**17**	**35**
	No Change		4.97	2.62	2.35
Northeast	WAPPL	STAR	2.03	1.95	0.09
Northwest	BLUBL	STAR	0.34	0.34	0.00
Northwest	TAKKL	STAR	0.02	0.02	0.00
Arrivals Totals			**7.36**	**4.93**	**2.43**
	No Change		2.91	2.60	0.31
East	MMALT	SID	2.30	1.45	0.85
North	DREMR	SID	0.14	0.00	0.14
North	LURIC	SID	1.99	1.49	0.50
North	STYCK	SID	0.02	0.02	0.00
Departures Totals			**7.36**	**5.56**	**1.80**
Note: Totals and subtotals may not match exactly due to rounding					

LBX 2019 Average Annual Day Operations by Route and Runway					
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**17**	**35**
	No Change		5.56	3.18	2.37
Northeast	WAPPL	STAR	2.27	2.17	0.10
Northwest	BLUBL	STAR	0.34	0.34	0.00
Northwest	TAKKL	STAR	0.02	0.02	0.00
Arrivals Totals			**8.19**	**5.72**	**2.47**
	No Change		2.93	2.62	0.31
East	MMALT	SID	2.87	1.60	1.27
North	DREMR	SID	0.14	0.00	0.14
North	LURIC	SID	2.22	1.66	0.55
North	STYCK	SID	0.02	0.02	0.00
Departures Totals			**8.19**	**5.91**	**2.27**
Note: Totals and subtotals may not match exactly due to rounding					

SGR 2014 Average Annual Day Operations by Route and Runway					
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**17**	**35**
	No Change		13.47	7.96	5.50
Northeast	CESAN	STAR	0.55	0.34	0.21
Northeast	WAPPL	STAR	3.76	2.16	1.60
Northwest	BLUBL	STAR	4.29	2.67	1.62
Northwest	TAKKL	STAR	7.68	5.11	2.57
Southeast	TKNIQ	STAR	1.53	0.86	0.67
Southwest	TCHDN	STAR	4.18	2.48	1.70
Arrivals Totals			**35.46**	**21.58**	**13.88**
	No Change		8.46	5.09	3.37
East	MMALT	SID	6.85	3.58	3.26
North	DREMR	SID	2.19	1.36	0.83
North	INDIE	SID	1.66	1.08	0.58
North	LURIC	SID	0.85	0.27	0.58
North	STRYA	SID	0.94	0.52	0.42
North	STYCK	SID	3.94	2.41	1.53
North	WYLSN	SID	1.00	0.76	0.24
South	KARRR	SID	2.14	1.41	0.73
South	WATFO	SID	0.16	0.14	0.03
West	BORRN	SID	7.26	5.03	2.23
Departures Totals			**35.46**	**21.65**	**13.82**
Note: Totals and subtotals may not match exactly due to rounding					

SGR 2019 Average Annual Day Operations by Route and Runway					
Side/Corner	**Proposed Procedure**	**Procedure Type**	**Total**	**17**	**35**
	No Change		14.36	8.48	5.87
Northeast	CESAN	STAR	0.50	0.34	0.16
Northeast	WAPPL	STAR	3.88	2.25	1.63
Northwest	BLUBL	STAR	4.50	2.78	1.72
Northwest	TAKKL	STAR	8.19	5.43	2.76
Southeast	TKNIQ	STAR	1.60	0.89	0.71
Southwest	TCHDN	STAR	4.37	2.61	1.76
Arrivals Totals			**37.40**	**22.78**	**14.62**
	No Change		9.06	5.42	3.63
East	MMALT	SID	7.10	3.72	3.38
North	DREMR	SID	1.30	0.87	0.43
North	INDIE	SID	1.75	1.14	0.62
North	LURIC	SID	0.90	0.28	0.61
North	STRYA	SID	0.99	0.54	0.45
North	STYCK	SID	4.18	2.54	1.64
North	WYLSN	SID	2.07	1.37	0.69
South	KARRR	SID	2.31	1.53	0.79
South	WATFO	SID	0.17	0.14	0.03
West	BORRN	SID	7.57	5.24	2.33
Departures Totals			**37.40**	**22.80**	**14.61**
Note: Totals and subtotals may not match exactly due to rounding					